Collapse and Recovery of DPRK Economy

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The following are excerpts from a study on the DPRK economy by Marcus Noland of the Institute for International Economics; Sherman Robinson of the International Food Policy Research Institute; and Tao Wang of the Institute for International Economics. The authors attempted to construct a model of the DPRK economy using available data and techniques. They then modeled various strategies of reform. They concluded that an import-oriented strategy would be more efficient for solving the DPRK's food shortages than an agricultural recovery strategy. They also argued that military demobilization would greatly improve the DPRK's economy. The full paper, including data tables and references, is available at:
http://www.iie.com/CATALOG/WP/1999/99-1.htm

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RIGOROUS SPECULATION The Collapse and Revival of the North Korean Economy

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Abstract

In this paper we use cross-entropy estimation techniques to construct the underlying data base for a computable general equilibrium model (CGE) of the North Korean economy, starting from incomplete data ridden with gross measurement errors. The cross-entropy estimation approach is powerful and flexible, allowing us to make full use of what information we have in whatever form. CGE modeling forces internal consistency. The end product is a model that incorporates fragmentary information in a rigorous way and allows us to examine the implications of a number of alternative scenarios including rehabilitation of flood-affected lands, liberalization of the international trade regime, and military demobilization.

North Korea is experiencing a famine. Its economy is characterized by systemic distortions and comparative disadvantage in the production of grains. As a consequence, the potential pay-offs to economy-wide reforms, even defined narrowly in terms of domestic food availability, dwarf more targeted attempts to raise agricultural productivity. Too many, this finding that a famine might be better addressed by the export of manufactures than the recovery of flood-damaged lands—is a striking and counter-intuitive result. Moreover, we find that if reforms were undertaken, the country could generate a significant additional "peace dividend" by partially demobilizing its enormous military.

INTRODUCTION

As well as can be ascertained, North Korea is now into its eighth year of economic decline. It has been facing food shortages at least since the early 1990s and is well into a famine of unknown magnitude. Despite the desperate situation internally, the government maintains the most militarized society on earth, with more than one million men (and increasingly women) under arms and devoting an estimated 25 percent of GDP devoted to military expenditures (US ACDA 1997). Economic reform could have enormous benefits in this highly distorted economy, especially in light of the country's dire situation. Yet, at the same time, the effects of reform—a significant increase in exposure to international trade and investment (much of this with South Korea and Japan, two countries with which North Korea maintains problematic relations) and huge changes in the composition of output, involving literally millions of workers changing employment—could be expected to have enormous political implications, possibly presenting large, perhaps insurmountable, obstacles to reform under the current regime.

The paucity of reliable statistical information about North Korea has bedeviled researchers, and, as a consequence, studies of the

North Korean economy have tended toward either uncritical recitations of official statistics or compendia of anecdotes. In this paper we use cross-entropy estimation techniques to construct the underlying data base for a computable general equilibrium model (CGE) of the North Korean economy, starting from incomplete data ridden with gross measurement errors. The cross-entropy estimation approach is powerful and flexible, allowing us to make full use of what information we have in whatever form. CGE modeling forces internal consistency. The end product is a model that incorporates fragmentary information in a rigorous way and allows us to examine the implications of a number of alternative scenarios including rehabilitation of flood-affected lands, liberalization of the international trade regime, and military demobilization. We do not consider the likelihood of the current regime undertaking any of these actions, or, indeed, any significant policy changes at all. Rather we simply examine the possible implications of various alternative actions.

Although we apply this approach to a reclusive Stalinist regime, in principle the same techniques can be applied to other situations in which economic data is fragmentary and/or of questionable reliability—a situation frequently encountered in developing countries.

To preview the results, we confirm that the North Korean economy is extraordinarily distorted. Due to the large, systemic nature of these distortions and North Korea's comparative disadvantage in the production of grains, the potential pay-offs to economy-wide reforms, even defined narrowly in terms of domestic food availability, dwarf more targeted attempts to raise agricultural productivity. Under reform domestic production of food declines, but human survival requirements are easily met through imports. In contrast, flood rehabilitation leads to an increase in domestic food production, but this increase falls short of human survival requirements. To many, this finding—that a famine might be better addressed by the export of manufactures than the recovery of flood-damaged lands—is a striking and counter-intuitive result. Moreover, we find that if reforms were undertaken, the country could generate a significant additional "peace dividend" by partially demobilizing its armed forces and redeploying its soldiers to more economically productive uses.

CONCLUSION

In this paper we have used cross entropy estimation to construct the data base for a CGE model of the North Korean economy. The modeling work extends the literature on the North Korean economy in a number of important ways. The model we construct is, to our knowledge, the first behavioral economic model to explicitly address the issue of North Korea's famine and the potential gains

to the economy from military demobilization.

Because the North Korean economy is so distorted, we find that the returns to systemic reform dwarf those associated with more narrowly conceived policies focused on agricultural recovery. Even defined narrowly in terms of the domestic food availability, the pay-offs to systemic reform are multiples of even costless recovery of flood-affected lands and the replacement of the flood-damaged agricultural capital stock. Potential increases in GDP from reform are on the order of 60 percent, with an additional 18 percent obtainable as a "peace dividend" if North Korea were to substantially demobilize its enormous military. With reform, domestic output of food declines, but domestic food consumption easily exceeds human survival requirements because of the availability of imports. In contrast, flood rehabilitation leads to an increase in domestic food production, but this increase falls short of the human survival target.

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