

INTRODUCTION

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As this new century progresses, outlines of a new world economy are taking shape. Globalization, technology and financial innovations continue to grow at an ever more rapid pace. China is poised to become the world's largest economy, but is also expected to rebalance to consumption oriented GDP and slower growth. The future of the Euro area is not clear, but slower growth seems to be all but certain, with financial troubles that survive the great crisis. The U.S. is showing signs of resurgence, but with a vanishing middle class, and much of the income gains going to the top percentiles.

How can we best understand the dynamics driving the differential rates of economic growth, competitiveness, and trade? The macroeconomic modeling approach is certainly useful, as it can tell a powerful story with a minimal amount of data. However, to understand many of the key questions confronting the different world economies, such as productivity, growth, investment and trade, industry analysis is valuable, and interindustry modeling has much to offer. This approach not only illustrates linkages from the demand side, but also can capture the cascading effects of relative price changes.

Linkages between countries are extremely important, and the nexus of trade and finance has become more intertwined and complex in recent years. Sectoral models can be linked through bilateral trade flows. Grasping the changing patterns of these flows of merchandise and services trade can help one to understand how a country's growth can stimulate that of other countries. Alternatively, it can explain how recession in a large country such as the U.S. can spread to Europe and beyond.

For several years, the INFORUM group has focused on the development of national level models that seek to combine the best features of the macroeconomic and interindustry modeling, to answer questions such as these. Since 1993, Inforum national partners have met annually at a World Conference to present papers and discuss modeling issues. The first conference was in Rennes, France in 1993 and the previous conference was held in Listvyanka, Russia at Lake Baikal in 2013. The XXII INFORUM World Conference was held in Alexandria, Virginia in September 2014, and this volume contains a selection of papers presented during the sessions of the conference. Some of the papers are devoted to specific modeling topics or policy issues, and others are oriented to the building of models.

A prominent paper is the first contribution by Bardazzi and Ghezzi, who are developing a new version of the bilateral trade model (BTM) that is used to link the international INFORUM models through trade flows. The authors provide a valuable survey of the taxonomy of trade models that have been developed by various economists, and highlight the special position of BTM as a central modeling framework linking individual models of different countries which may be potentially of quite different structure, sectoring schemes, and level of complexity. This will be version 3 of BTM. The first version was created by Douglas Nyhus starting in the 1970s, growing out of his PhD thesis work, and the second version was developed by Qiang Ma in 1996 and further extended by Qing Wang.

Both Bardazzi and Ghezzi are students of Maurizio Grassini, who presents a critique of factors content and trade in value-added models. The new international trade database developed by Bardazzi and Ghezzi provide a rich environment for testing such theories. Closing the first section is the paper of Shirov and Yantovsky, who investigate the potential benefits of trade relations between the EU and the Eurasian Economic Union, and also make a quantitative estimate of potential costs of Russian sanctions, on both Russia and the EU. This is a very important topic, and an example of the potential benefits that a system of linked models can offer. Although the previous versions of BTM did not include Russia, it will be included in BTM 3, and will be able to offer insights on energy and other trade with Russia.

The framework of the interindustry macroeconomic model is particularly useful for the study of questions of energy supply, demand, and pollution. The section on energy and environment begins with the paper by Plich on the situation of shale gas extraction in Poland. This paper explores the outlook for shale gas production in Poland in several alternative scenarios using the Polish IMPEC model, out to 2050. Note that Poland is one of the European countries most likely to develop shale gas in the mid-term horizon. The next paper is by Sasai and the Japanese team, and uses the JIDEA model to study the effects of abandoning nuclear power in Japan. The effect on the price of electricity and the demand for fossil fuels is considered, and the authors also study the ripple effects of the higher prices on other producing sectors. The paper by Suslov looks at the prospects for renewable energy in Russia. In general, the results are pessimistic for renewable energy development, due partly to the rich endowment of fossil energy resources in Russia, but also because of institutional barriers and lack of infrastructure. However the large surface area of Russia potentially provides opportunities for solar, wind, geothermal and small scale hydropower development. Tagaeva and Gilmundinov discuss ways to improve environmental policy in Russia. They discuss the current set of taxes and incentives in place in Russia, and then present some alternatives. This section is rounded out by a paper by Mullins and Nkosi on using the South African INFORUM model Safrim to calculate the macroeconomic impacts of GHG mitigation. South Africa has a relatively high carbon to

GDP ratio, due to the prevalence of coal-fired power generation. The paper provides a valuable description of the Safrim model, and how it can be applied to do a detailed analysis of mitigation of GHG emissions at their source.

Demographic projections are very important for the understanding of long-range forecasting of personal consumption, and an important context for the study of the labor market, education issues, and pension, retirement and medical policy. The next section includes a paper by Manprasert discussing the estimation of a new demographics-based consumption system for Thailand. He has developed an INFORUM model for Thailand, and is now in the process of updating and extending that model. The paper by Stöver and Wolter from the German team is on the impacts of ageing on the level and structure of private consumption in Germany. Potapenko describes a model for projecting long-term demographic changes in Russia, and gives insight into the modeling techniques used for this type of study.

A wide variety of policy studies are presented in the next section. Meade describes using an employment projections model to explore the requirements for skilled and educated labor in Tanzania. This study is an example of building an INFORUM model for an underdeveloped country for which not much data are available. Such a model can be very useful as a tool for understanding labor force issues. Latvian fiscal projections and analysis are detailed in the paper by Ozolina, Auzina-Emsina and Pocs from the Latvian team. Joubert and Nkosi present an analysis of the macroeconomic impacts of the South African broiler industry. Two policy areas of Russia are explored by Gilmundinov and Bozo. Gilmundinov presents a GE-IO model, still under development, which is used to model impacts of fiscal and monetary policy on the Russian economy. Bozo's paper develops a taxonomy of influences on the supply and demand of various industries related to macroeconomic factors, and applies this to estimating the effects on the sectoral structure of Russia.

The final section of the volume focuses on new model developments. An exciting new model from the Russian team at Rosneft describes the development of the World Economic Dynamics (WED) model, and describes specific analysis of energy sectors. Su and the Taiwan team describe an application with the new Taiwan model called INFORTW. Savchishina and Serebryakov provide updates of the development of two models of Russia, the Russian Interindustry Model (RIM), and the Russian National Accounts model (RuNA). The closing paper of the volume is an introduction to the modeling of Turkey, with the new Turina model.

This collection of papers supplements earlier volumes that have presented papers from other INFORUM world conferences. The last volume published was entitled *Development of Macro and Industrial Methods of Economic Analysis*, and was edited by the team at Novosibirsk, presenting papers from the Baikal conference. It will be quite interesting to see what the next conference in Thailand will offer.