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Evaluation of global models ☆

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Abstract

Complicated and sophisticated global models are available and popularly used (but commonly without model evaluation procedures), and hence, the question of how one can evaluate a global model is worth being investigated. We discuss whether or not these global models together can be fully utilized and, if so, how this might be achieved.
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1. Introduction — Type of global models

Considering how to capture the major features of the global economy is truly a daunting task. The world contains six billion individuals divided into about one and a half billion families, each of which provides at least one decision maker. There are also many millions of other decision

makers, including government units and corporations. In total there will be at least two billion decision makers, all interacting, throughout the globe.

It would be possible to build a single and quite simple model for the whole world economy using just aggregate variables. An aggregate global GDP data series has already been constructed and, similarly, data for other important macro variables such as production, consumption and, possibly, unemployment could be formed.[2] However, there are already international markets for interest rates and for various commodities, such as oil and the major metals, producing global prices. We have not seen an example of such an "aggregate world model" but it is likely that several do exist. If such a model is dynamic, it could be used to form forecasts of all the global variables involved. The recent discussions about a world central bank (called a global federal bank) would be relevant in the construction of this model in the future (see www.grb.net).

The other extreme would be to build a separate econometric model for every country in the world. The obvious problem is that many countries are very small, economically. Currently the United Nations has 192 members (including San Ramino but not the Vatican). We suspect that the majority of these countries would not have data of sufficient quality or quantity for an adequate model to be built, although we have no direct information on this. We call this the "all country model." It does not exist and we see little reason for it unless a model is needed for every individual country, however small.

Model LINK has an extensive history and there is plenty of experience with it and comes closest to the all-country model. It currently involves "over sixty" countries each with its own model, according to its web-site. However, it is not easy to obtain examples of specifications for these models but the most recent one that we saw was based on traditional macroeconomic theory and used an error-correction form. It was thus both linear and dynamic. Project LINK is an example of a "many-country model". There is a mention on the web, under "link", leading to its Toronto center and a full account of the LINK meeting in Mexico, May 2005. This includes discussion of outputs, some forecasts but no discussion of the econometric form of the models, nor of the economics behind it. The web link also presents many forecasts, but without confidence intervals and with no discussion of evaluations. It appears to be a very old-fashioned approach!

Among the forecasts provided are three given in May 2005 for oil prices (Brent, $/pb) for the years 2004 ($38.3), 2005 ($46.0) and 2006 ($37.0) whereas oil prices actually reached $78 in 2006 and were at $58 on October 19, 2006. As the original forecasts were given without confidence intervals these actual values are difficult to interpret, relative to the forecasts. There seems to be generally little knowledge of LINK in the profession (although some academics do know the group who run the local model). This is surprising as world-wide link must be a major employer of econometricians it is also generally known that Larry Klein is closely involved with the models.

An obvious alternative strategy is to group countries in convenient ways. An IMF web site in 2006 includes the following summary information:

Countries	% World GDP	% World population	% Exports
8 major countries	46	12	47
29 advanced countries	55.5	15.5	73.4
China	12.6	20.9	5.3
India	5.7	17.2	0.9
8 major+China+India	64.3	50	53
29 advanced+China+India	73.8	53.5	79.6

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[2] But, some of these aggregates would make little economic sense as definitions vary across countries and there is no single market for employment.