

GLOBAL FOOD DEMAND AND SUPPLY BY 2050

Abstract

By 2050 the world population will increase to more than 9 billion people according to estimates by the UN Department of Economic and Social Affairs, UN (2005). It is estimated by FAO that global food production needs to at least double by 2050 in order to meet demand, FAO (2009). In this paper, we analyse food demand by 2050 based on estimates for population growth, agricultural production and shifting demands. We start by estimating global production of vegetabilia by 2050 using time series econometrics. Next we construct a global demand model including various food items and other goods. The demand model is estimated using the FAO-database and other data in a dynamic econometric setting. This will allow us to provide projections for how food demand develops globally, due to changes in income and relative prices? This question has been important to researchers since Malthus' *An Essay on the Principle of Population*, Malthus (1798), wherein introduced the famous hypothesis that the growth in food demand, as a result of increasing population, would exceed growth in food supply. Food demand has increased substantially since Malthus published his hypothesis, but so has supply and presently production of food is abundant. But even with global excess supply of food, there are people without access to sufficient food supply due to low income.

Increasing incomes in specifically countries with large populations shifts food demand towards meat and other animalia. These changing consumption patterns significantly increase the demand for cereals and oil seed for feed production. Furthermore, growth in production of energy from agricultural produce e.g. in the form of biofuel additionally competes for agricultural land. Thus, the question of the paper is whether global agricultural production is able to accommodate for sufficient food supplies by 2050. The result of this paper is projections of food demand, due to changes in consumption patterns of animalia and vegetabilia, as a result of income developments, using estimated growth in production of vegetabilia.

The method used in this paper is an economic model and a statistical model. The economic model is a consumer demand system, the Almost Ideal Demand System of Deaton and Muellbauer (1980) in a

setting applied in Lind (2000). The model is nested in a dynamic statistical model, a dynamic co-integrated VAR model. The estimation method follows the Johansen's maximum likelihood procedure, Johansen (1998), which takes account of simultaneous equations. Thus, this approach addresses the problems of simultaneity, omitted variables, non-constant elasticities and serial correlation. The data used will come from FAOSTATs online database. Subsequently, the estimates are used to make projections for the world food demand and supply applying population projections from the UN and income projections by the World Bank.

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