

Impacts of agricultural subsidy reform on economic welfare, environment and health

Background:

Agricultural subsidies are prevalent in nearly all countries across the globe. The main objective of subsidies is to ensure plentiful food production, and to guarantee basic income to farmers. In most countries this is achieved by raising the long-term level of prices above free-market levels and/or by providing direct payments to farmers. Agricultural subsidies mainly help to influence the cost and supply of commodities such as wheat, feed grains, livestock, milk, rice, sugar, and oilseeds such as soybeans. However, they have been criticised for their potentially adverse effects on (i) economic welfare (Koo und Kennedy 2006), (ii) the environment (Baylis et al. 2008, Recanatì et al. 2019) and (iii) health (Lock et al. 2010, Schäfer Elinder 2005, Veerman et al. 2006). In this study we quantify the economic, environmental and health impacts of agricultural subsidies and analyse what consequences a phasing out or re-purposing of those subsidies could have.

Preliminary analysis:

The agricultural distortions in the GTAP data base (Aguiar et al. 2016) are shown in Table 1. These values comprise domestic policies such as subsidies and taxes on primary factors, intermediates and final output. This data shows some clear patterns. First, there are regions that highly subsidise agricultural production, such as the EU, EFTA, USA and Asia (where China is highly supportive), while other regions are net taxing their farmers, such as Africa and South America. Second, the distribution of agricultural payments is biased to starch-based products like rice, wheat and other grains, as well as towards other animal feeds like oilseeds or are directly linked to animal products. Fewer subsidies are paid for nutritionally valuable crops with relatively low environmental footprints such as fruits and vegetables. Sugar, while subsidized in many developed countries is net taxed in developing countries which have a comparative advantage in sugar production. Since the latter are the main producers of sugar, the sector shows a positive net-taxation when looking at the data on a global scale.

Table 1 suggests that current subsidies are contributing to increase the availability and decrease the price of agricultural products that are not very beneficial from a health perspective. The over-consumption of these goods and under-consumption of nutritionally important foods, such as fruits and vegetables, has been identified to contribute to diet-related diseases, such as cardiovascular diseases, cancer, diabetes and obesity (GBD 2017 Risk Factor Collaborators 2017), which in turn are leading to higher health-care expenditure and lost productivity. In addition, high production of

animal-source foods and agricultural products in general is contributing to environmental degradation (Schäfer Elinder 2005; Springmann et al 2018b). The presentation will detail and quantitatively estimate those impacts.

Table 1: Agricultural Distortions

	EU28	EFTA	USA	Asia	Australia	Africa	SouAm	Rest	Total
Rice	-232	-2	-68	-10213	-2	1527	197	377	-8416
Wheat	-1346	-89	-1551	-3167	58	143	251	1936	-3765
Oth. Grains	-1397	-207	-5017	-5338	-3	3208	592	982	-7180
Vegetables & Fruits	-4120	-178	-1452	-14124	31	8755	826	9503	-759
Oilseeds	-1685	-62	-2187	-5958	6	1727	1410	690	-6059
Sugar	-172	-23	-102	-358	5	166	409	260	185
Oth. Crops	-6850	-252	-1494	-1027	16	1335	1725	1072	-5475
Cattle	-5591	-936	-1305	-964	-134	1266	1114	-7	-6557
Pig&Poultry	-3510	-513	-1076	-4545	-33	459	619	854	-7745
Milk	-3718	-1145	-1028	-241	-20	112	502	1810	-3728
Total	-28621	-3407	-15280	-45935	-76	18698	7645	17477	-49499

Source: GTAP database 9a with base year 2011. Values in mio. US-\$. Negative (positive) values indicate net-subsides (net-taxes).

Methods:

To study the impact of various subsidy schemes in a systematic way, we will employ and combine several simulation models. We will use MAGNET (Woltjer und Kuiper 2014), a computable general equilibrium model (CGE) which is based on the GTAP model and database but has a more detailed representation of agricultural aspects to specify scenarios of agricultural subsidy reform. And we will use a comparative risk assessment model (Springmann et al, 2018a) and a dataset of country-specific environmental footprints (Clune et al, 2016) to analyse the health and environmental implications of those reforms. The scenarios of subsidy reform will include a phasing out of all agricultural subsidies, and a re-purposing of current subsidies away from staples and animal products towards fruits and vegetables. The latter scenario is motivated by calls for changes towards healthier and more plant-based diets to stay below a global warming of less than 2 degrees Celsius (Springmann et al, 2018b). Results will be differentiated by region.

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