What roles for farm technology and trade policies in feeding the planet?

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What roles for farm technology and trade policies in feeding the planet?

Rapid trade-led economic growth in emerging economies has been shifting the global economic and industrial centres of gravity away from the north Atlantic, raising the importance of Asia in world trade, and altering the commodity composition of trade by Asian and other countries. The industrial boom that began with Japan in the 1950s and Korea and Taiwan from the late 1960s has spread to much more populous China and India. Together economic growth in resource-poor Asia and associated structural changes are altering the world’s agricultural markets and thereby national and global poverty and food security. In particular, those forces, together with new biofuel policies in the US, EU and elsewhere at a time of high and volatile fossil fuel prices, have contributed to high and volatile international food prices. True, there have been agricultural export booms in some other emerging economies, most notably Brazil, but they have had only a minor offsetting effect on prices.

In some recent modelling work,1 we projected the world economy to 2030 and then asked how that baseline projection could be altered by farm technology policy reforms on the one hand or, on the other hand, by agricultural protection growth.

In the baseline the share of developing countries in global GDP rises from one-quarter in 2007 to almost one-half by 2030, and their average per capita income rises from 33 to 56 percent of the global average. That greater spending power in developing countries boosts the global demand for food, and so even though we assume reasonable farm productivity growth in that baseline projection, the real international price for agricultural and food products in 2030 is projected to be 10 percent above the 2007 level.

If global farm productivity growth were to be just 1 percent per year slower over that period, however, farm product prices in international markets would be not 10 but 25 percent higher in 2030. This underscores the importance of continuing to invest in agricultural R&D.

It happens that the social rate of return to such further investments is very high, because of past underinvestment and the need to adapt to climate change,\textsuperscript{2} so diverting public funds for this purpose is highly likely to be growth enhancing.

It matters where that R&D is undertaken though. If the investment is only in relatively poor African economies with high population growth, it boosts not only food supply but also food demand, because that technological improvement raises real incomes non-trivially in those countries (in contrast to the relatively minor boost it would provide in high-income countries). We modelled a scenario in which grain productivity in just China and India was boosted by a further 0.5 percent per year over the projection period. Of course it boosted those Asian countries’ grain self sufficiency by several percentages points, as well as their per capita consumption of calories; but it would reduce the rise in international farm product prices by less than 1 percent in aggregate and by only 3 percent for grains.

What also matters is which farm technologies are the focus of any new R&D efforts. Traditional crop improvement breeding is very slow, taking on average about 25-30 years from initial expenditure to widespread improvements on farms – and only if the R&D is successful. By contrast, the world has been blessed in recent decades with the development of new biotechnologies and nanotechnologies that allow accelerated and more-targeted crop breeding, including for desirable traits such as higher yields, more nutrients, or drought tolerance. Moreover, these traits can be stacked, so further speeding developments. The parts of the world that have allowed the adoption of new biotech crops have enjoyed substantial benefits, as also have consumers there and elsewhere insofar as those biotechnologies have lowered international food prices. Many countries have denied themselves these new technologies, however, and some have made it clear they will not accept imports from countries that have taken them on board. Such moratoria are therefore discouraging many developing countries from embracing this new technology – even though those economies may export very little food to the moratorium countries. The cost to such developing countries’ farmers and food consumers has been shown to be enormous, and to far outweigh any economic benefit that may accrue to those exporters from their country’s GM-free status.\textsuperscript{3}

If developing countries neglect to expand their investments in agricultural R&D, including on new high-payoff biotechnologies, they not only forego the economic growth and


poverty alleviation it would most likely provide but they also would be less food self-sufficient. Should that raise demands for protection from food imports that governments cannot resist, the consequent growth in agricultural protectionism would raise domestic food prices and thus make net buyers of food in those developing countries more food-insecure. It would also reduce export prospects for farmers in food-surplus economies.

By contrast, if the WTO’s Doha Development Agenda could be resurrected and then concluded with commitments to open markets multilaterally, such trade reforms would not only boost global economic welfare but also – according to a new set of national and global modelling case studies – reduce global inequality and poverty.\(^4\) Less poverty usually means more food security. But multilateral reform of agricultural trade would also ‘thicken’ international food markets, and reduce the capacity of countries to insulate their domestic markets from variable world food prices (especially if it was agreed that export restraints also be disciplined more by the WTO). A very desirable consequence of such a comprehensive multilateral trade reform would be less fluctuation in international food prices and fewer and less-severe food price spikes – especially if biofuel subsidies and mandates also were to be removed, thereby reducing the link between food and fossil fuel prices.