

Of the three crises currently occupying the economic stage - the subprime mortgage crisis (and attendant asset-backed commercial paper), the oil crisis and the food crisis, the last one is by far the most serious. While in the United States and Canada, governments worry about the falling value of bank stocks, financial liquidity and the possibility of an economic slowdown, the developing world has seen a dramatic growth in food shortages, social discontent, rioters in the streets and lives with the prospect of an augmented pool of many millions of hungry families. At the same time, Canada has reaped enormous gains from being a net exporter of energy, food and fertilizers.

The different factors in play

Energy

Energy prices have been rising gradually for several years, though they have increased most dramatically in the last year (see Figure 1). Food prices bear some similarity, in that their price ascent has been steep and recent (see Figure 2), which has prompted some observers to ask if fuel prices are driving food prices through their impact on fertilizers, fuel used in farm machinery and product transportation. But this is not the case: Agriculture Canada reports that fuel and fertilizers account for about 15% of farm expenses, and that these inputs increased in price by 20% between 2006 and 2007.¹ This implies that such price increases account for about a 3% increase in farm expenses. So fuel prices, considered as a cost input, are not driving food prices directly in Canada.

Nonetheless, Canada's food market is very different from, say, Malawi's. In Canada the farm-gate price of grain accounts for just a fraction of the price paid in the supermarket: processing, packaging, transportation, marketing, retail margin account for virtually all of the revenue accruing from a package of rice. In Malawi, in contrast, as in most of Africa and Asia, the road between the harvest and the market place is much shorter. The result is that a doubling of the prices of many grains in the last year or

two on
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kets has resulted in food inflation of just 4 to 5% in developed economies, but has led to staggering percentage increases in less developed economies. Households living on a few dollars a day have experienced dramatic declines in their purchasing power, and aid agencies universally declare that recent food price hikes will result in additional tens of millions of people living in hunger, and millions more hunger-related deaths.

The second suspect for the food price rises comes from the demand side, in the form of higher living standards in China, India and much of the developing world. This is a variant of the Malthusian fear² that population growth will stretch the world's food capacity to such an extent that price rises will kill off the demanders rather than the excess demand. To make matters worse, not only will the demand for staples continue to grow with incomes, the demand for meat (which requires a lot of energy to produce) will grow even faster.

1. Agriculture and Agri-Food Canada, *Canada: Farm Fuel and Fertilizer Expenses*, Bi-weekly Bulletin, Vol. 27, No. 4, March 28, 2008.
2. From Thomas Robert Malthus (1766-1834), who stated this theory in his *Essay on the Principle of Population* (six editions were published from 1798 to 1826).

Viewpoint

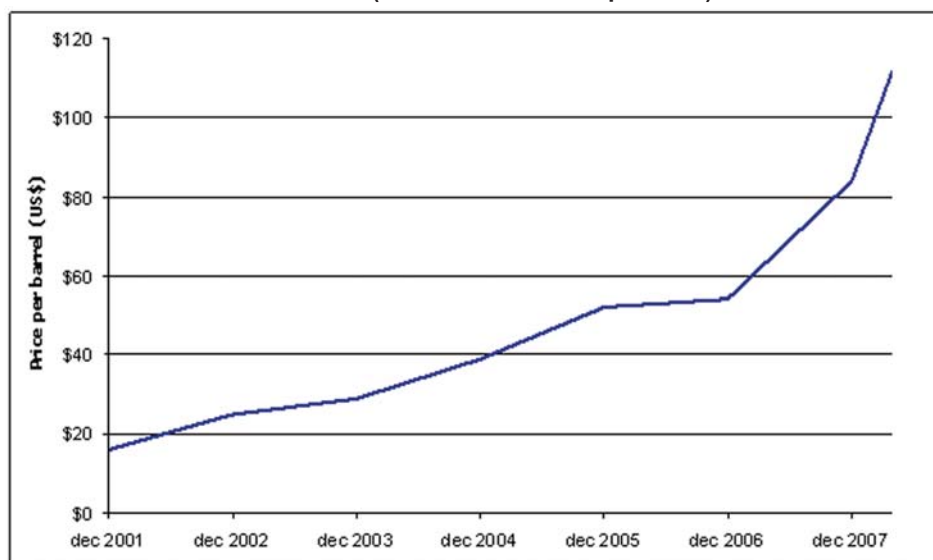
on the world food crisis

While world income growth will indeed continue to exert pressure on prices, it cannot explain the unforeseen food price explosion that has been concentrated into the last two years. If demand from India and China is the driver, food prices should have risen slowly, not rapidly, since their rate of growth in grain demand has not varied appreciably over the last ten years.

A small supply decline

The third candidate for the food price ascent comes from the supply side. The IFDC (an international center for soil fertility and agricultural development) reports that "world cereal production decreased from 2.05 billion tons in 2005-2006 to 2.01 billion tons in 2006-2007, partly because drought limited Australia's wheat crop. And the world's cereal inventory has dropped to its lowest level in the past 20 years - from 471 million to 428 million tons in the same period, according to the UN Food and Agriculture Organization (FAO)."³ Since the demand for grains is relatively unresponsive to price movements, small changes in supply and demand can cause major price changes. The supply decline here is of the order of 2%, and if demand is growing at a rate of, say, 4%, this means that prices should rise by a multiple of the combined 6% on account of low demand inelasticity.

Figure 1
Price of oil (December 2001 to April 2008)



Source: Illinois Oil & Gas Association.

Ethanol and other biofuels

The fourth suspect on the crime scene is the astonishingly ill-considered ethanol and biofuel program in the United States (and Canada). Much has been written on the negatives of this policy, yet the magnitude of its impact is not always appreciated. While it was designed primarily as a means of reducing U. S. dependence on imported oil through the provision of a more environmentally-friendly fuel, it falls down on both counts. Even if the entirety of the US corn acreage were devoted to ethanol, this would reduce oil imports just fractionally. Furthermore, so much conventional fuel is used in its production that there are doubts about whether there are any reductions in carbon-emissions, or even any net increase in energy production, as a result of its use. To make matters worse, the program grants a

tax credit to producers and levies a tariff on cheaper, lower carbon, sugar-based ethanol from Brazil.

The growth in ethanol production facilities in the last two years has been meteoric: there are now almost 200 in the United States. If production capacity continues to expand at this rate, the goal of 35 billion gallons by 2017 may be reached several years earlier. Subsidies amount to \$10 billion annually at the present time, and the pump-price of ethanol covers just a fraction of the economic cost of production.

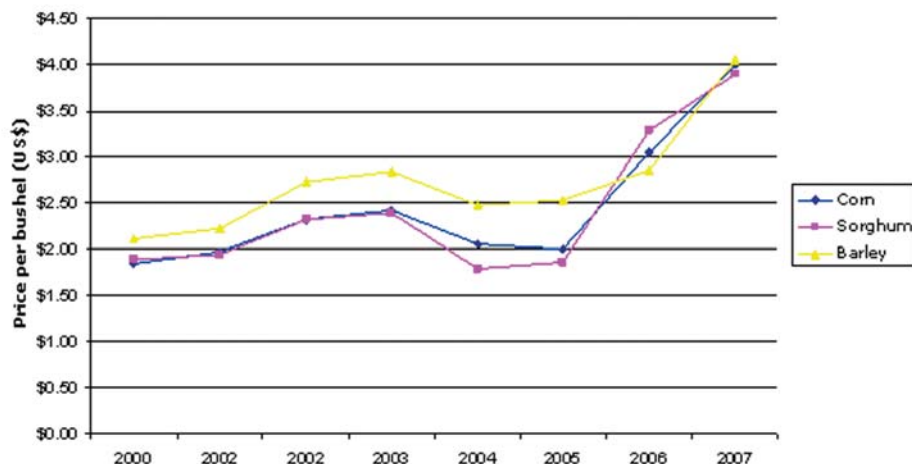
The supply response has been dramatic, in that corn has been directed away from animal feed and consumer use (as a vegetable and sweetener) towards ethanol. It is estimated that as much as one quarter of the total corn acreage will go to ethanol in 2008. Some redirec-

3. See Thomas Hargrove, "World fertilizer prices soar as food and fuel economies merge," February 2008.

Viewpoint

on the world food crisis

Figure 2
Price of corn, sorghum and barley
at farm gate in the United States (2000 to 2007)



Source: U.S. Department of Agriculture – Economic Research Service.

tion of land from soybeans, wheat and others to corn has reduced the supply of these other grains below what they would have been, and contributed in turn to their price rises.

The cost of fertilizers

The increasing demand for land for corn is not the only significant increase in derived demands. With higher farm-gate prices, it becomes profitable to use more inputs in order to increase yields. Corn thrives on nitrogen-based fertilizers, and the increasing demand for this, and other phosphate-based fertilizers and potash have put heavy pressure on the prices of these products also. Furthermore, since natural gas is a principal ingredient in the production of some fertilizers, its independent higher price in recent years has also contributed to fertilizer price escalation on

the cost side.

The IFDC reports that price of diammonium phosphate stood at \$250 per ton in January 2007, and had tripled to \$750 by January 2008. The price of urea rose from \$272 to \$415 per ton in the same period, and the Vancouver price of muriate of potash rose from \$172 to \$352. Canada is the world's biggest producer of potash and is a large exporter of fertilizer. The fertilizer industry is concentrated in Alberta and Saskatchewan. Its profitability is reflected in the share price of Potash Corporation of Saskatchewan. Corrected for share splits, its price rose from \$10 at the end of 2000 to \$60 in May of 2007 and on to \$180 in April 2008.⁴

While a thriving world fertilizer market is a boon to the Canadian economy, it also hurts sub-

sistence agriculture in less developed economies. Jeffrey Sachs, the director of the Earth Institute at Columbia University and special advisor to the United Nations Secretary General, is an advocate of fertilizer aid to less developed economies. He proposes that agriculture can be much more efficient and yield larger harvests, in Africa in particular, if the right inputs can be used. But millions of farmers cannot afford to buy them at current elevated prices.

The solutions

To summarize: long term growth in the world economy should see a continuation in the rising demand for food products. The recent food spikes have been caused primarily by a series of shorter term shocks and poor policy measures that have seen some economies benefit (Canada for example) and others suffer tremendously. The critical question is: what can be done to improve the situation?

Supply increases are the answer. Despite the predictions of Malthusians such as Paul Erlich and his Club of Rome in the seventies, the world still has tremendous additional supply capacity. There exist at least three channels through which supply can be increased.

First, world trade policy has been singularly unsuccessful in the area of agriculture. In contrast to agreements of the *North American Free Trade*

4. Source: Yahoo Finance. Request stock quote on 'POT.'

Viewpoint

on the world food crisis

North American Free Trade Agreement type, wherein trade in capital, consumer goods and human capital has thrived, most developed economies have chosen to implement a protectionist structure around their agricultural sectors. Ban Ki-moon, Secretary General of the United Nations, has called for a dismantling of the protectionism that impoverishes poor economies through impeding their ability to export their produce. The present era of high prices presents a golden opportunity to eliminate such barriers. Yet Canada, at both federal and provincial levels is opposed to such steps, as are most of the European Union and the United States.

The massive subsidization of Western agriculture has prevented many less developed countries from developing and investing in their own sectors. Not only have developed economies subsidized their own producers, they have frequently dumped excess supply on international markets, thereby undermining producers in less developed countries. Now that food prices are high, those countries find themselves in the

improvident position of depending upon aid from those economies that have historically undermined them.

Second, there remains scope for widespread efficiency gains in agriculture in the third world through the more effective use of inputs - fertilizer in particular, despite the recent run-up in prices. As an example, rice farmers in Bangladesh are switching to a root-based nitrogen fertilizer that comes in the form of small briquettes. Rather than 'broadcasting' a granular fertilizer into the paddy fields, and see much of it wash away, they plant briquettes at the root base, use about half as much as before, and get about 20% higher yields. Additionally, higher yielding and more blight-resistant seeds are now available in the world market. They are more expensive nonetheless, and the challenge is to get them into the hands of farmers who are capital constrained. Such new hybrids formed the 'Green Revolution' of the sixties and seventies in India and elsewhere that saved many millions from starvation.

Third, there remains an abun-

dance of land in middle-income economies that is not under pressure for urban development. This is particularly true of the former Eastern Block, where agricultural supply was woefully inefficient under the collectivized system. Until very recently, the problem was how to reduce the excessive amount of land in use on account of the growth in output since switching to private ownership.

In sum, the solution to the present spike in prices is to get supply back on track. There is ample agricultural capacity in the world economy and scope for efficiency growth that, together, can offset the impact of supply shocks, poor energy policy in the United States, and protectionist policies in the developed economies in general. How soon the potential increase supply can manifest itself in the market place remains highly uncertain. The Kansas and Chicago grain markets currently price end-of-2010 deliveries at about the same price as end-of-2008 deliveries. This suggests that the financial markets believe that supply will be slow to catch up on the continuing expansion in demand.

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