Competitive, trade-friendly nations weather volatile crop yields best

November 23 2009

Richer nations with competitive crop production and few trade barriers would fare the best if climate change, weather events or other factors cause yields of grain and oilseed crops to become more volatile, a new study has found.

By these criteria, the United States is poised to do well, but France would come out on top, according to the study of 21 countries conducted by economists at Oregon State University.

"It's important to know this because yields of most rain-fed grains and oilseeds remain highly variable despite decades of agronomic advances," said the study's lead author, Jeff Reimer. "Their yields depend largely on weather. Research shows that climate change may increase variability in yields of some crops."

The study, which has been published in the *Agricultural and Resource Economics Review*, forecasted how changes in yields of grain and oilseed crops would affect the inflation-adjusted gross domestic product (real GDP) of each country's agricultural sector. That's a gauge of economic performance.

Reimer looked at the countries' abilities to import and export these crops. Then using a computer model, he increased the likelihood of abundant or insufficient crops by a hypothetical and arbitrary 30 percent and let trade volume fluctuate. As yields became erratic, this meant some countries without enough crops needed to import more while others that had surpluses exported more. Consequently, the value of world trade doubled.

Fourteen of the 21 countries posted a decrease in the real GDP of their agricultural sectors mainly because of spikes in crop prices. In the study, an increase in prices was considered to be bad because crop buyers had to pay more. A rise in farmers' profits was considered to be good because growers made more money.

France came out on top with a 5.1 percent increase in the real GDP of its agricultural sector. That's because prices plunged 21 percent while farmers' profits rose 2.3 percent.

"France is in a unique situation," said Reimer, an OSU agricultural economist who specializes in global trade. "Compared to many countries, it has few import barriers and good infrastructure so it can easily import when crops are cheaper elsewhere. Also, France buys a broader array of crops than its farmers produce. So increased global demand for French crops tends to not drive up prices for the country's consumers. Its farmers, meanwhile, benefit from the increased international demand for the particular crops that they specialize in."

Statistical analysis showed that low-income countries tended to have higher trade restrictions and below-average productivity. As a result, they suffered the most because they weren't as prepared to import or produce when shortages required it, Reimer said. Among them was Morocco. It was in last place with a 19 percent contraction in its agricultural sector's real GDP owing to a one-two punch of skyrocketing prices and declining output.

The United States placed sixth with real GDP in its agricultural sector increasing 1 percent as a hike in farmers' profits erased the "bad" effect of an increase in prices.

"The United States is such a big exporter that when global demand for its crops rises, Americans end up paying higher prices," Reimer said.

In another scenario, Reimer examined what would happen if uncertainty about yields increased 30 percent while protectionism increased.

"I looked at this as a possibility because countries have historically responded to shortages of crops in other parts of the world by cutting themselves off from trade," Reimer said. "This can exacerbate swings in consumer and producer prices."

He found that real GDP in agricultural sectors worsened in 18 countries primarily owing to rises in crop prices. That's because increased protectionism, such as higher tariffs, made it more costly to import when there was a bad crop at home and harder to export when there was a domestic supply glut. Low-income countries again suffered the most because they tended to be less efficient at importing the crops cheaply.

Once more, France fared the best with a 1.8 percent increase in real GDP in its agricultural sector as prices dropped 5.6 percent and its farmers saw a 2.4 percent increase in profits. The United States ranked third as declines in prices and profits canceled each other out.

"In the United States, the interests of consumers and producers are more at odds with each other than they are in France," Reimer said. "Imports are a small share of consumption, so the crops that are consumed in the U.S. are similar to those that are produced in the country. When protectionism rises overseas, U.S. farmers see less profit and U.S. consumers benefit from cheaper prices."

The study found that of the 21 countries, the United States, followed by France, was the most open to imports. Zimbabwe was the least receptive. The study looked at countries' abilities to trade based on tariffs, geographic locations, government regulations, incentives, common languages and membership in trade agreements. In terms of growing the crops in the study, the United States was also the most competitive. France was fifth, and Peru was the least competitive. The higher a country's yields and the lower its price for cropland, the more competitive a country was, according to the study.

Source: Oregon State University (news : web)