Has Exchange Rate Volatility Affected Broiler Trade Flows?

Introduction

• Poultry has been the leading meat export in the United States for the past 7 years, accounting for over 35 percent (13.4 million pounds) of total U.S. meat exports in 2009.

• Poultry is primarily the United States’s second largest export in the world after Brazil.

• Exchange rates play an important role in determining agricultural exports, and studies have found that exchange rate fluctuations significantly affect trade flows when imports are seen as commodity-specific (Markussen, 1998; De Grauwe and Staubli, 2000).

• Rose (2000) and Sun et al. (2002) found that the effect of exchange rate volatility on imports for a given sector is typically negative.

• We use the Gravity framework to determine the effects of exchange rate volatility on world broiler trade, and accounting for the conventional factors that determine the gravity of trade such as distance, national income, population, etc.

• More specifically, we assess the short- and long-term effects of exchange rate volatility on broiler trade.

Estimation Procedure

The gravity model is used to estimate the determinants of broiler trade flows between two countries adjusted to inflows and outflows. It follows:

\[ \text{Log importer’s real GDP} \times \text{Log exporter’s real GDP} \times \text{Log importer’s population} \times \text{Log exporter’s population} \times \text{Distance} \times \text{Common border} \times \text{Language} \times \text{Currency} = \text{Log broiler trade} + \text{Error term.} \]

Note that the parameters are defined as follows:

- Log importer’s real GDP: Log real GDP of the importing country in current dollars.
- Log exporter’s real GDP: Log real GDP of the exporting country in current dollars.
- Log importer’s population: Log population in the importing country.
- Log exporter’s population: Log population in the exporting country.
- Distance: Distance between countries in terms of miles.
- Common border: Equals 1 if countries share a common border and 0 otherwise.
- Language: Equals 1 if countries speak a common language and 0 otherwise.
- Currency: Equals 1 if currency is the same in both countries and 0 otherwise.

For estimation, we took the natural log of equation (1) and econometric methods for panel data were used to estimate the model. Each measure of exchange rate volatility considered separately, and the results are reported in the table. For comparison, we do not estimate the results using equation (2) in the short term, and equation (3) is the long-term.

Data

Broiler trade data for all countries were provided by UNComtrade, United Nations Statistics Divisions, for 1999-2010. Real GDP data were obtained from the World Bank, International Monetary Fund, Hanline Insight, and Oxford Economics. Forecasting. Real exchange rates were obtained from USDA’s Economic Research Service–International Trade Division. Population data are provided by the U.S. Census Bureau. The distance between countries was obtained from the website: http://www.distancesfrom.net.

Summary of Estimation Results

Gravity model estimations results: Dependent variable is the log of broiler trade flows

<table>
<thead>
<tr>
<th>Variable</th>
<th>Short-term (t observations)</th>
<th>Long-term (t observations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log importer’s real GDP</td>
<td>0.516 (6.414)</td>
<td>0.853 (10.570)</td>
</tr>
<tr>
<td>Log exporter’s real GDP</td>
<td>-0.009 (0.613)</td>
<td>-0.040 (3.607)</td>
</tr>
<tr>
<td>Log importer’s population</td>
<td>0.192 (2.809)</td>
<td>0.266 (6.139)</td>
</tr>
<tr>
<td>Log exporter’s population</td>
<td>-0.039 (0.613)</td>
<td>-0.013 (0.280)</td>
</tr>
<tr>
<td>Distance</td>
<td>-0.052 (0.613)</td>
<td>-0.013 (0.280)</td>
</tr>
<tr>
<td>Common border</td>
<td>-0.039 (0.613)</td>
<td>-0.013 (0.280)</td>
</tr>
<tr>
<td>Language</td>
<td>0.192 (2.809)</td>
<td>0.266 (6.139)</td>
</tr>
<tr>
<td>Currency</td>
<td>0.028 (0.613)</td>
<td>0.028 (0.613)</td>
</tr>
<tr>
<td>Exchange rate volatility</td>
<td>-0.039 (0.613)</td>
<td>-0.013 (0.280)</td>
</tr>
</tbody>
</table>

Future Research

• Explore other measures of exchange rate volatility.
• Economic the Haldane Analysis Control Critical Point Food-safety system for poultry processing operations.
• Determine new trade creation established through regional agreements.

References


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The views expressed are those of the authors and should not be attributed to USDA.