Anticipating Consumer Demand in a Mercurial Price Climate:
Cross-Price Elasticities across Multiple Goods

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**METHODOLOGY**

Price elasticity measures the percent change in quantity demanded given a percent change in price. Three commonly measured types of price elasticities are:

1. **Income Elasticity**—assumes the consumer’s marginal utility of income is constant;
2. **Price Elasticity**—assumes the consumer’s marginal utility of income is related to consumption level, and
3. **Cross-price Elasticity**—assumes the consumer’s marginal utility of income is unchanged (substitution effect). Our methodology uses the parameters and estimated income-price elasticities from the Florida-PI model in Seale et al. (2003). It begins with the Slutsky cross-price elasticity, estimated as:

\[ e_{ijc} = \frac{E_{ijc} - E_{S_{ijc}}}{E_{S_{ijc}}} = \frac{\beta_i \phi_{ijc}}{E_{S_{ijc}}} \]

where \( E_{ijc} \) is the budget share at geometric mean price of good \( i \) in country \( c \), \( \beta_i \) is the income elasticity of demand for good \( i \) in country \( c \), \( \phi_{ijc} \) is the marginal share, and \( E_{S_{ijc}} \) is the income elasticity of demand for good \( i \) in country \( c \).

**RESULTS**

Using the parameters estimated by Muhammad et al. (2011), we calculate the marginal shares and the cross-price elasticities for food and nonfood, first for a two-good demand model, and then for a nine-good demand model. Results indicate that:

- **Consumer response to a change in food price is much greater than consumer response to a change in nonfood price.**
- **Across a nine-good demand system, the cross-price effects from food price changes affect low-income countries five times more (on average) than high-income countries, assuming compensation for income changes.**
- **A percentage change in food price results in greater demand change for nonfood products in lower income countries than in high-income countries.**

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Food and Nonfood Budgets</th>
<th>Food and Nonfood Budgets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income countries</td>
<td>-0.206</td>
<td>-0.228</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>-0.010</td>
<td>-0.024</td>
</tr>
<tr>
<td>High-income countries</td>
<td>0.018</td>
<td>0.068</td>
</tr>
</tbody>
</table>

**REFERENCES**


Further research:

The above methodology can be extended to estimate cross-price elasticities for the second-stage demand model, which covers eight food subcategories (bread and cereals, meat, fish, dairy products, oils, fruit, and vegetables, beverages and tobacco, and other food products). 2011 ICP data covering more than 170 countries are expected to be available in 2014. Given that the new data cover more countries and allow for a greater disaggregation of both the broad consumption categories and the food subcategories, we expect to provide updated demand and cross-price statistics, which will be valuable to economic analysts.

**FURTHER RESEARCH**

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**BIBLIOGRAPHY**


