ERS Report Summary

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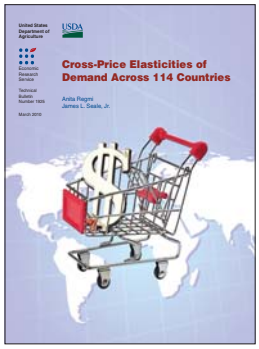

This is a summary of an ERS report.

Find the full report at *www.ers.usda.gov/publications/tb1925*

Cross-Price Elasticities of Demand Across 114 Countries

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The extent to which price fluctuations in one good may affect the demand for other goods (that is, the cross-price elasticities) varies across goods and countries. This report estimates cross-price elasticities across 114 countries for 9 major consumption categories: food, beverage, and tobacco; clothing and footwear; education; gross rent, fuel, and power; house furnishings and operations; medical care; recreation; transport and communications; and "other" items. In addition, the analysis provides cross-price elasticities for a two-good demand system involving food and nonfood items. The estimates are based on 1996 price data from the International Comparison Program, a multinational statistical project that collects price data that can be compared internationally for a basket of goods and services. The elasticities presented here are the only consistent, cross-country, cross-price estimates available for such a large number of countries and consumption categories.

What Is the Issue?

Price increases in goods and services may induce consumers to substitute cheaper products for more expensive—but perhaps higher quality—products that they feel they can no longer afford. Price increases also reduce the real income of consumers, leaving less disposable income for other goods and services. At the global level, price increases may reverse gains made by poor nations toward improved nutrition and welfare for their populations. This study's estimates of consumer response to rising and falling prices across 114 countries can help policymakers assess future needs for goods and services, as well as for related transport and infrastructure. Awareness of demand and consumption trends across countries, essential for predicting shifts in demand for different products, can be a valuable tool for those in the agricultural, manufacturing, education, health, and energy sectors.

What Did the Study Find?

For each category of goods, the study estimated 2 sets of cross-price elasticities for 114 countries: (1) the compensated **Slutsky elasticity**, calculated assuming that the real level of income stays constant, compensated by an amount equivalent to the price rise of the good; and (2) the uncompensated **Cournot elasticity**, calculated assuming that the existing level of income stays constant, with no money added to cover the good's increased price.

Two-Good (Food-Nonfood) Elasticity Comparisons

In the two-good (food-nonfood) model, an increase in the price of the nonfood good, when accompanied with a compensating increase in income (the **Slutsky elasticity**), prompts increased food demand in all countries, but the middle-income countries experience the greatest increase in food demand.

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By comparison, an increase in the price of a nonfood good, when not accompanied by a compensating increase in income (the **Cournot elasticity**), leads to increased food demand in the poorest countries and declining food demand in wealthier countries.

Nine-Good Elasticity Comparisons

In the nine-good model, when price increases are offset by equivalent income increases (**Slutsky elasticities**), the model finds:

- A price increase for one good triggers increased demand for the other eight goods; that is, the Slutsky cross-price elasticities are positive. But the demand increases for the other goods are not equal. Demand for the more luxurious of the remaining eight goods, such as recreation, increases more than demand for a necessity, such as food or clothing.
- When the price of a necessity (food or clothing) rises, the increases in demand for the other eight goods are greatest in the low-income countries and smallest in the high-income countries. That is, the Slutsky elasticities decrease as the income level trends upward across the 114 countries.
- When the price of a non-necessity rises, increases in demand for the other eight goods (except for food) are smaller in the low-income countries than in the high-income countries; that is, the Slutsky cross-price elasticities are lower in the low-income countries and higher in the high-income countries.

In the nine-good model, when there is no increase in income to offset the price increases (the **Cournot elasticities**), the model finds:

- When a price increases for a necessity, the demand for all the other goods declines; that is, the Cournot cross-price elasticities for food and clothing are negative. That is true for all countries: low-income, middle-income, and high-income.
- When a price increases for a non-necessity, the demand response varies, based on the country's income level and the good in question. For example:
    - In all countries, when the price of recreation increases, the demand for other goods rises; that is, the Cournot cross-price elasticities are positive for recreation.
    - On the other hand, when the price of transport and communications rises, the demand for other goods goes up in low-income countries, but declines in middle- and high-income countries. That is, the Cournot cross-price elasticity for transport and communications is positive in low-income countries and negative in high-income countries.

How Was the Study Conducted?

This study builds on the models and findings from an earlier ERS report, *International Evidence on Food Consumption Patterns* (TB-1904, 2003), to derive a methodology that can be used to estimate cross-price relationships. That study estimated income and own-price elasticities for a 9-good system (that is, for 9 broad consumer consumption categories) across 114 countries. Using the parameters and estimated income and own-price elasticities from the earlier ERS report, the present study describes a framework for estimating cross-price elasticities. The authors then calculate the compensated and uncompensated cross-price elasticities for the same 9 consumer consumption categories as the earlier report, as well as for a 2-good, food-nonfood pairing, across the same 114 countries. Estimates from the earlier study have been widely used as input to economic models such as USDA's Baseline model. The cross-country elasticity estimates from the present study should also provide valuable input for other economic models designed to forecast consumer demand when prices change. The methodology for obtaining the elasticities will aid future ERS efforts at estimating cross-price elasticities.