

**Numerical Exercise 1: Determinants of Food Demand**

After graduation, you are hired by Cargill (a giant grain marketing company) to work in their overseas operations. Your first assignment is to estimate likely annual growth in the consumption of different grain products that Cargill might be able to sell in two large developing countries, Indonesia and Nigeria, in the next few years. The main question is whether, in Indonesia and in Nigeria, consumption will grow faster for cereal grains in the form of human food or in the form of feed for poultry.

This is a tough question but luckily you took AGECE 340 (and maybe even kept the textbook), so you recall that in Week 3 of the semester (and on pages 54-55 of the text), the key determinants of demand growth are income growth per capita (called " $g$ "), the income elasticity of demand (" $n$ "), and total population growth (" $p$ "). From these you can calculate growth in consumption demand ( $D$ ) by the formula  $D = p + ng$ .

Now, you need to find numerical estimates of these variables. In your textbook (page 47) you find estimates of  $n$  for cereals and for various livestock products in several countries, including Indonesia and Nigeria. For  $p$  (population growth), the most authoritative sources is the latest "World Population Prospects": go online to < <http://esa.un.org/unpp>>, and click on "Panel 2 (Detailed data)", then from the "Select Variables" menu choose "Population Growth Rate", from the "Select Country" menu choose Indonesia and Nigeria, for "Select Variant" choose the "Medium variant" projection and set the start year to 2005 and the end year to 2010. This will give you estimated annual population growth for the current period. That leaves open the question of income growth. By how much will per-capita income be changing? This depends on the country's luck, the quality of government and so forth, but you interview various economists who tell you that for each country a "fast growth" scenario would be 5% per year, and a "slow growth" scenario would be 3% per year.

From this information, using a spreadsheet or hand-calculator you compute projected growth rates of consumption for each product under each scenario, and enter the results below. When calculating, be careful to enter all percentages appropriately (that is, 1% = 0.01).

**DATA AND RESULTS FOR CONSUMPTION PROJECTIONS, NIGERIA AND INDONESIA**

	DATA				RESULTS	
	Projected population growth, 2005-10 ( $p$ )	Projected income growth per capita ( $g$ )	Estimated income elasticity of demand ( $n$ )		Projected consumption growth ( $p+ng$ )	
			Cereals	Poultry	Cereals	Poultry
Nigeria with fast income growth						
Nigeria with slow income growth						
Indonesia with fast income growth						
Indonesia with slow income growth						

Using these numbers, enter the correct answer in the space below. If the answer depends on the whether the country's follows its fast or slow income growth scenario, write "can't tell".

- (a) For which commodity, cereals or poultry, will consumption grow faster? \_\_\_\_\_
- (b) In which country, Indonesia or Nigeria, will cereals consumption grow faster? \_\_\_\_\_
- (c) In which country, Indonesia or Nigeria, will poultry consumption grow faster? \_\_\_\_\_