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Economics 201

Demand-related Elasticities

We can calculate elasticity measures that show how quantity demanded or quantity supplied change in response to a host of related variables, but our focus here will be to concentrate on the measurement and interpretation of several demand-related measures of elasticity. The point here will be to determine how consumer purchases of a particular good respond to changes in one of three different variables: the price of that good, consumer income, and the price of a related good.

Each of these demand-related elasticities will be calculated by comparing the percentage change in consumer purchases (i.e. quantity demanded) to a percentage change in one of the different demand-related changes mentioned at the end of the first paragraph. It's easiest if we work with a specific good, so let's work with the good discussed in one of the handouts on the demand and supply model, street vendor popsicles that are sold in Louisville.

Own-price elasticity is calculated by dividing the percentage change in the quantity demanded by a percentage change in the price of that same good. For example, let's assume that street vendor popsicles increase in price from $1 to $1.25 (i.e. a 25% increase in price). Based on the Law of Demand, we know that this price increase will lead to street vendors selling fewer popsicles, but will it be a lot less or just a small decrease? Let's say that street vendors sell 10% fewer popsicles after this price change. Assuming this is a relatively constant relationship, if we divide -10% by 25%, we have an own-price elasticity of -0.4 (note that a negative percentage change here is expressed as -10%, rather than just 10%, which would be a percentage increase).

Interpretation: because the percentage change in price is greater in absolute value than the percentage change in quantity demanded, we say that the demand for street vendor popsicles is inelastic. That is, given that our own-price elasticity measure is less than 1.0 in absolute value, then the demand for street vendor popsicles is inelastic. Of course, if the opposite were true and our value for own-price elasticity was greater than 1.0 in absolute value, then we would say that demand here is elastic.

Income elasticity is calculated by dividing the percentage change in the quantity demanded of a good by a percentage change in consumer income. For example, suppose consumer income rises by 2.5%, and that after this change in income, demanders buy 5% more popsicles from street

vendors. Again, assuming that the relationship here is a relatively constant one, we can calculate the income elasticity by dividing 5% by 2.5%. That gives us an income elasticity of 2.0. Note that it's also possible an increase in income could lead consumers to buy fewer popsicles from street vendors. E.g., maybe people view these popsicles as a relatively low quality product and as their income increases, they see the popsicles sold in stores as a more attractive purchase. For now, however, we'll assume that this isn't the case.

Interpretation: first, due to the fact that higher income leads to greater popsicle sales for street vendors, we know that street vendor popsicles are a normal good. That is, due to the income elasticity being a positive value, we know that these popsicles are a normal good. If the purchase of street vendor popsicles decreased after consumer income increases, then we would say that these popsicles are an inferior good.

Given that the percentage change in quantity here is greater than the percentage change in income, we can also say that the demand for street vendor popsicles is *income elastic*. That is, given that our income elasticity measure is greater than 1.0, we know that street vendor popsicles are income elastic. Put another way, our income elasticity measure tells us that street vendor popsicles are considered a luxury. If this measure was less than 1.0, then this good would be considered a necessity.

Cross-price elasticity is calculated by dividing the percentage change in the quantity demanded by a percentage change in the price of some related good. For example, let's assume that store-bought popsicles experience a 50% decrease in price. If, after this price decrease, we observe street vendors selling 10% fewer popsicles, then by dividing -10% by -50%, we have a cross-price elasticity that's equal to 2.0.

Interpretation: because the percentage change in the quantity of street vendor popsicles sold is moving in the same direction as the percentage change in the price of store-bought popsicles, the relationship we clearly have is that of substitutes. That is, given that our cross-price elasticity measure is greater than zero, we can say that this measure tells us that street vendor popsicles and store-bought popsicles are substitutes. Although it's hard to imagine that store-bought popsicles and street vendor popsicles are complements (ok, not just hard, more like impossible, haha), then this relationship would be indicated by having a cross-price elasticity that's less than zero (i.e. negative).