The Generalized Law of Demand

TheoryGuru applications

Load Economicreasoning package only if it is not already loaded

```
If[Length@Names["PLTools`*"] < 10,
 Get["http://economicreasoning.com"]]
```

Notes

p and *p'* are each a price vector.
q[*u*,*p*] is the vector of Hicksian demands corresponding to utility/output *u*.

In the Wolfram Language, x.y refers to the tensor DOT PRODUCT, NOT scalar multiplication. For TheoryGuru purposes, tensor means vector, so that the result of x.y is a scalar.

Setup

```
revealedpreference =
  {p.q[u, p] ≤ p.q[u, p'](* q[u,p] is cost minimizing for p *),
   p'.q[u, p'] ≤ p'.q[u, p](* q[u,p'] is cost minimizing for p' *)};
```

This holds for any number of goods (i.e., regardless of the lengths of the vectors).
This holds even if:

- preferences are not convex,
- demand functions are not continuous,
- more than one price is changing, and
- the price changes are not marginal

Result

```
TheoryGuru[revealedpreference,
  (p' - p) . (q[u, p'] - q[u, p]) ≤ 0]
```

```
True
```

If *p* and *p'* are the same except for the *i*th price, then this result just says that the own substitution effect is negative for good *i*.

Variable interpretations