

Market Power and Moral Hazard

TheoryGuru applications

(c) Copyright 2019 by JMJ Economics

Setup

See also Are Invisible Hands Good Hands?

```
prem is premium
τ is copay
q[τ] is plan consumption
pvdrprice is the price that the plan pays to providers
mc is marginal cost
v[prem, τ] is plan's ex ante indirect utility
-v(1,0)[prem, τ] is ex ante marginal utility of income
```

Load Economicreasoning package only if it is not already loaded

```
In[1]:= If[Length@Names["PLTools`*"] < 10,
  Get["http://economicreasoning.com"]]
```

Proof & Logic Tools 6.3

(c) Copyright 2016, 2017, 2018, 2019 by JMJ Economics

Type ERCommands for a list of commands in the package.

Introduction to Automated Economic Reasoning		
Tutorials:	Entering calculus	General Mathematica tips
Get started	Load extras	Browse examples

Premiums cover plan costs

```
In[2]:= prem = (pvdrprice - τ) q[τ];
```

Plan optimizes

```
In[3]:= PlanOptimizes = D[v[prem, τ], τ] == 0;
```

Definitions

$$\text{In[4]:= ImpactofPriceonAggSurplus} = \frac{\frac{\partial v[\text{prem}, \tau]}{\partial \text{pvdrprice}}}{-v^{(1,0)}[\text{prem}, \tau]} + \frac{\frac{\partial ((\text{pvdrprice} - \text{mc}) q[\tau])}{\partial \text{pvdrprice}}}{\partial \text{pvdrprice}};$$

$$\text{In[5]:= ImpactofCopayonAggSurplus} = \frac{\frac{\partial v[\text{prem}, \tau]}{\partial \tau}}{-v^{(1,0)}[\text{prem}, \tau]} + \frac{\frac{\partial ((\text{pvdrprice} - \text{mc}) q[\tau])}{\partial \tau}}{\partial \tau};$$

$$\text{In[6]:= DemandSlopesDown} = q'[\tau] < 0;$$

$$\text{In[7]:= PlanPassThrough} = \frac{\frac{\partial \tau}{\partial \text{pvdrprice}}}{\partial \text{pvdrprice}} > 0;$$

$$\text{In[8]:= HoldMCConstant} = \frac{\frac{\partial \text{mc}}{\partial \text{pvdrprice}}}{\partial \text{pvdrprice}} == 0;$$

$$\text{In[9]:= HoldPriceConstant} = \frac{\frac{\partial \text{pvdrprice}}{\partial \tau}}{\partial \tau} == 0;$$

$$\text{In[10]:= SignConditions} = \{v^{(1,0)}[\text{prem}, \tau] < 0, v^{(0,1)}[\text{prem}, \tau] < 0\};$$

Results

Aggregate surplus is always improved by moving price toward MC

$$\text{In[11]:= TheoryGuru}\{\{\text{PlanOptimizes}, \text{DemandSlopesDown}, \text{PlanPassThrough}, \text{HoldMCConstant}\}, \\ \text{SameSign}[\text{mc} - \text{pvdrprice}, \text{ImpactofPriceonAggSurplus}]\}$$

Out[11]= True

If price exceeds MC, the aggregate surplus is improved by a lower copay

$$\text{In[12]:= TheoryGuru}\{\{\text{PlanOptimizes}, \text{DemandSlopesDown}, \text{SignConditions}, \\ \text{HoldPriceConstant}, \frac{\frac{\partial \text{mc}}{\partial \tau}}{\partial \tau} == 0\}, \\ \text{SameSign}[\text{mc} - \text{pvdrprice}, \text{ImpactofCopayonAggSurplus}]\}$$

Out[12]= True

Variable interpretations