

# Revisiting the Welfare Economics of Moral Hazard

By

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# Introduction



- Health insurance is one of the major topics in the field of health economics.
- Addressing the demand for health insurance has been the focus of many researchers for several years.
- Providing health insurance affect the individuals behavior.
- Health insurance is associated with many problems.



## Introduction (Continued)

- Moral Hazard is one of these major problems in which individuals trade-off between incentives and risk bearing.
- The topic of Moral Hazard occupied a large part of the literature.
- Many tools have been used to manage this problem.



# What is Moral Hazard

- In Economics, **moral hazard** occurs when one person takes more risks because someone else bears the cost of those risks.

-A moral hazard may occur where the actions of one party may change to the detriment of another after a financial transaction has taken place.

-Moral hazard occurs under a type of information asymmetry where the risk-taking party to a transaction knows more about its intentions than the party paying the consequences of the risk information.

# What is Moral Hazard (Continued)



- Moral hazard also arises in a principal–agent problem, where one party, called an agent, acts on behalf of another party, called the principal.

-The agent usually has more information about his or her actions or intentions than the principal does, because the principal usually cannot completely monitor the agent.

-The agent may have an incentive to act inappropriately (from the viewpoint of the principal) if the interests of the agent and the principal are not aligned.



## What is Moral Hazard (Continued)

- Many tools have been used to manage this problem and these tools were classified into two types:

a- the demand side

b- the supply-side.

-The demand management of moral hazard minimizes the problem of moral hazard partially, and its believed that the supply management helps in solving this problem (Albert MA,2002).

-Another way of dealing with the problem of moral hazard was to analyze the components of the cause of this problem.

- Moral Hazard depends on the type of health insurance plans provided to individuals.



## Aim of this Paper

To confirm that using indemnity health insurance decreases the problem of Moral Hazard in which people are over utilizing health care services  
by using the **MaGuire** model



# The Model

According to the optimal health insurance model (McGuire, 2011), the expected utility function consumers tend to maximize is as follows

$$EU = pU^s(x, y^s) + (1 - p)U^h(y^h)$$

Where:

EU: Is the expected utility of income

p: Is the probability of getting sick

x: The quantity of health care coverage

$y^s, y^h$  : Income when sick and income when healthy respectively

$U^s, U^h$  : Utility when sick and utility when healthy respectively



## The Model (Continued)

The McGuire model assumes that the price of care is one, and the individual pays a coinsurance ( $c$ ), and a premium ( $\pi$ ) when buying insurance. The total income of the individual is ( $I$ ).

$$EU = pU^s(x, I - \pi - cx) + (1 - p)U^h(I - \pi)$$

If the coinsurance is  $c$  and the individual consumes  $x$  when sick, the fair premium,  $\pi = p(1-c)x$ .



## The Model (Continued)

$$EU = pU^s(x, I - p(1-c)x - cx) + (1-p)U^h(I - p(1-c)x)$$

$$\frac{dEU}{dc} = pU_y^s(xp - x) + (1-p)U_y^h(px)$$



# The Model (Continued)

Our model uses the same expected utility function with the indemnity health insurance.

The expected utility function will be as follows:

$$EU = pU^s(x, I - p(1-c)x - x) + (1-p)U^h(I - p(1-c)x + (1-c)x)$$

# The Model (Continued)



The first order conditions with respect to the amount of coverage ( $x$ ) and coinsurance ( $c$ ) is as follows:

$$\frac{dEU}{dx} = p(U_x^s + U_y^s(-p(1-c) - 1)) + (1-p)U_y^h(-p(1-c) + (1-c))$$

$$\frac{dEU}{dc} = pU_y^s xp + (1-p)U_y^h(p-1)x$$



# Results and Discussion

According to McGuire first derivative with respect to  $c$ , shows that at any  $c > 0$  the first order condition is negative, and thus the optimal  $c$  would be at the value of zero.

In our model the first order condition with respect to  $c$  can be rewritten as follows:

$$\frac{dEU}{dc} = p^2 x(U_y^s - U_y^h) + xU_y^h < 0$$

As  $c$  increases, income transfers from the sick to the healthy state.

Setting  $c=0$ , the MRS between health care and the marginal utility of income when sick equals to one according to McGuire model:

## Results and Discussion (Continued)



$$\frac{U_x^s}{pU_y^s + (1-p)U_y^h} = 1$$

In our model, as  $c = 0$  rewriting the first order condition with respect to  $x$  yield the following:

$$\frac{U_x^s}{pU_y^s + (1-p)U_y^h} = \frac{1+p}{p}$$

## Results and Discussion (Continued)



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In our model, as  $c = 0$  rewriting the first order condition with respect to  $x$  yield the following:

$$\frac{U_x^s}{pU_y^s + (1 - p)U_y^h} = \frac{1 + p}{p}$$

Meaning the MRS between health care and the expected value of the marginal utility of income is greater than one



## Results and Discussion (Continued)

- In order to equalize the **Marginal Utility** of health care with the expected **Marginal Utility** of income we need to use **less** care (x) compared to McGuire model.
- A better way for utilizing medical services, and less moral hazard welfare loss. This is consistent with Nyman results that emphasis the indirect relation between the income effect and the probability of being sick.
- Its also consistent with Nyman results that eliminating the income effect will lead to less welfare losses.

## Results and Discussion (Continued)



- The higher the probability of being sick the less the problem of moral hazard since we need to use less  $x$  compared to those with lower probability of being sick.
- Those with pre-existing conditions might not over utilize medical services when having indemnity type of insurance.

# Summary



**Purpose:** The aim of this paper is to confirm that using indemnity health insurance decreases the problem of Moral Hazard in which people are over utilizing health care services.

**Approach:** This paper modified the microeconomic model of utility that explains the relation between risk and incentives of using health care services developed by Thomas McGuire.

**Findings:** The model concludes that individuals with high probability of getting sick don't over utilize medical services when having indemnity health insurance.



## Summary (Continued)

**Social implications:** This paper suggests that using indemnity health insurance reduces Moral Hazard by the placing of responsibilities on both the insured and the insurer. The insured will be more careful when using health care services and might use preventive care.

**Value:** This paper adds to the literature a new mathematical approach that supports the provision of indemnity health insurance and why it might be preferable to universal health insurance.

**Thank You**

