

# Micro Economic Use In Health Sector

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## Abstract

*The hospital situation description shows that the hospital needs to understand an economics. Economics is a scientific discipline widely used by other disciplines. Economy is the art of making the most out of life, while, economics in general discusses how resources are allocated among various alternative uses to satisfy human desire. Economics is divided into two; microeconomics and macroeconomics. Microeconomics deals with the individual economic behavior, such as consumers, companies, organization, and shareholders. Macroeconomics discusses economic behavior in the "aggregate" manner. Human activities in a society are divided into 3 main (economic) activities: (1) production activities, (2) consumption activities, and (3) exchange activities. Economics gives a lot of attentions on the three main economic activity processes and the elements concerned with these activities (producers, consumers, traders, government, and so on). Actually, In the hospital sector, it is not common to name a patient a consumer and to name hospital a producers. It is assumed that the noble values of the medical profession might be eroded by these names.*

**Keywords:** micro economic, hospital, health sector, economic behavior, management system

## 1. INTRODUCTION

A hospital as an economic unit certainly has a production, consumption and exchange element. The basic driving factor of economic activity emerges because of the health service need. This need is a goal and motivation in providing the hospital service [1].

Each group of people has three basic problems in everyday life related to the rare resources. The three basic problems are:

- (1) What to produce and in what quantity?
- (2) How do you manage the available economic resources (production factors)?
- (3) For whom are these goods produced or how are the goods or services distributed to the people?

Hospitals as an organization that produces health services and goods might certainly utilize economics to achieve the efficient service [2]. In the hospital sector which has a social aspect, these three basic questions are relevant, especially when the hospital develops a business with a social mission [3].

Hospital, in this case, can produce various service activities. Class A hospital might have 25 installations with different products, starts from inpatients to catering for those who want to be healthy. Hospital is no longer only providing the service for the sick, but also providing the service for those who want to keep healthy and get healthier. The service, for example, is general check-ups or child development services. In addition, the unrelated services to the sick, but require biomedical technology, are fitness clinics and weight management [4].

In producing these products, absolutely, the hospital possesses various production factors (economic sources) such as human resources, equipment, buildings, land, and software for management systems. These resources management aims to get maximum results in which the management requires an economics understanding [5].

The fundamental question that might be faced by the hospital regards who should be served by the hospital. This is the hardest obstacle, because it requires equal and justice consideration [6]. First, what kind of clinical service should be provided? Should it provide all clinical services? Does it utilize the advanced technology or not? Advanced technology is always associated with the high resources utilization, because the origin of advanced technology is from biomedical, biological engineering, military, and telecommunications technology which require modern equipment based on computers. Thus, high-tech equipment, consumable, and treatment always use expensive imported materials [7].

The second problem is the fund source for the hospital product, whether from the patient's own pocket, taxes, or insurance system? If it sources from the patient's pocket, the hospital will automatically only serve those who can afford it, likewise, the health insurance system [8]. The insurance premium amount depends on the service and imported technology. Data shows that only a small proportion of people are willing and able to pay the insurance premium. If the hospital service depends on the tax system, there must be the government political power to allocate the budget for health by which requires the ability of the public to pay large taxes [9].

The third problem is to strive in ensuring whether the government subsidies shared by the hospital could be received by a man in need? In this case, the problem is the identification of the poor who deserve the subsidies. The experience of the Social Safety Net (JPS) program shows that the infrastructure for the poor data cannot yet be used as a basis for allocation. The fourth question is who regulates hospital production services in a region? Who has the right to give the hospital license? As a business entity, does the Investment Coordinating Board give the license, or is it the government through the Ministry of Health, or local government, or the Indonesian Hospital Association (PERSI), or is it an investment regulatory body.

## **2. Economy and Hospital**

In solving the fundamental economic problems in the hospital sector, there are two main approaches; the market mechanisms application and the government control through a system based on the welfare-state principle [10]. In various countries, currently a change in the health sector is a system dominated by state planning and control to a system that relies more on market mechanisms. This striking transition occurred in the health care system in England during the "Thatcherism" of the 1990s.

As an illustration, currently the tariff mechanism system is widely used by economic actors in various sectors of economic life. The economic approach in the health sector obviously emphasizes the tariff mechanism in solving economic problems of health sector. When the tariff mechanism is applied, the hospital manager must pay heed to the microeconomic principle [11]. One of the main microeconomic goals is providing an understanding of mechanisms and tariff system effect.

Thus, in an economic unit, a tariff discussion linked to the profit or loss criteria is not taboo. For example, is it taboo to dispute a VIP ward tariff of government-owned hospital based on the pros and cons? If the VIP ward tariff turn out to be loss, the patient's subsidies with a weak economy change into a strong economy. Various studies have revealed that the VIP ward tariff in the government-owned hospital is suffering the state, because they are actually rich subsidies [12]. However, another benefit of having a VIP ward in the government-owned hospital makes human resources as a production factor feel at home because it can increase their income from the VIP ward. If no VIP ward, it is possible that specialist doctors will work in a private hospital to increase their income. It is hoped that the comfort of human resources working in the government-owned hospital, the quality of service will improve, including the poor [13]. It is hoped that non-material benefits will be a factor that supports the existence of VIP wards in the government-owned hospital.

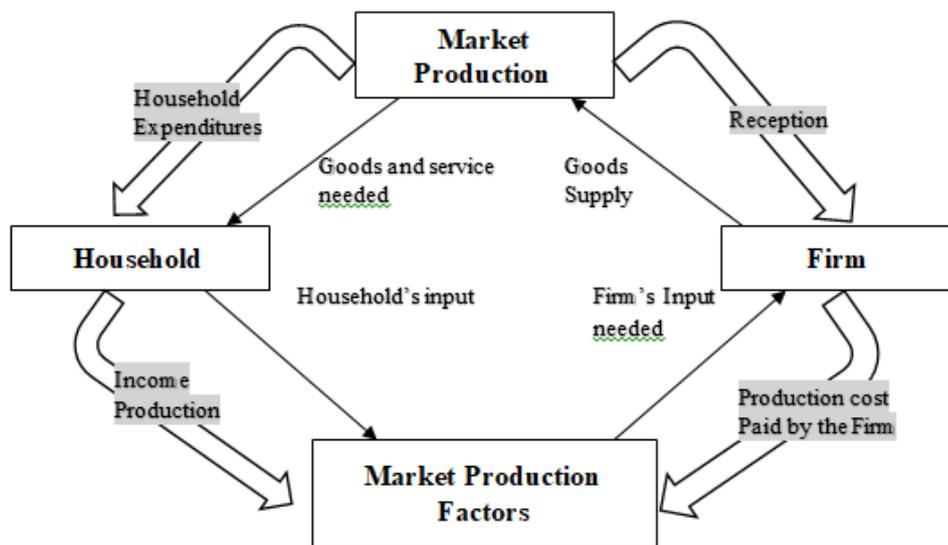
In discussing the use of economics in the health sector, it needs to understand a positive analysis and normative analysis. Positive analysis deals with cause and effect problems describing the

human behavior fact in the economy. For example, a positive statement is: "if the Indonesian government increases the drug tax, the poor will reduce the drug consumption". This positive statement does not indicate the bad or good thing. The questions that contain a positive analysis are: What are the causes of poverty in Java? What is the effect of increasing cigarette excise on smoking behavior? These questions can only be answered by the data.

In contrast, a normative statement contains a decision based on certain values. As an example of a normative statement, namely: "all poor patients who are hospitalized have right to receive a free medicine from the government". The correctness of this normative statement depends on the situation and local ethical norms [14]. For example, in rich areas such as Kutai Kartanegara Regency, it is unethical if the local government does not pay for poor patients who come for treatment. However, if the poor patient is at the poor hospital, this normative statement will be difficult to realize.

### 3. Circular Flow Model

This circular flow model states that economic activity is circular (See Figure 5.1). The figure shows the services and goods flow, as well as the inputs to the production system. The business entities (firms) provide services or goods for a household needed. Meanwhile, the household provides the input supply needed for the business [15]. The outer circle shows the money flow. The household spends money on goods and services that will be the firm's income. These resources will flow back to the household as payment for their labor supply. This principle makes the economic system rolling continuously [16].



By using a circular flow model, the hospital can be a business entity that provides a health service in the production market. By providing the health service, the hospital as a business entity would have a revenue from the household's expenditure. On the market side of production factors, the hospital needs inputs, for example, a labor from the community [17]. By using labor input, the hospital has production costs which is the household income part. This model can be used to explain various health policy and management problems in Indonesia.

In fact, this model ignores the government factor. This neglect is not based on the reality on the field. For example, the health sector in Indonesia is financed about 30% by the government budget in the form of routine activities, projects, and subsidies. In this sector, absolutely, the role of government cannot be ignored. However, in understanding the economic application in the health sector, it is recommended to understand this model.

**4. Supply and Demand Model and Price Mechanism**

To understand the economic concept, beside the Circular Flow model, it needs to understand the Supply and Demand model. This model can explain why there is a dynamic relation between the household and the firm. This relation occurs in the market. The market definition is: the entity's group or individual that are related to one another to sell or buy. In the hospital sector, for example the "hospital VIP ward market" in a city. This market occurs when the city hospital provides the VIP ward service (as seller) and patients who are willing to buy the VIP ward (as buyer). The use of VIP ward is for the public to have the right to decide the choice, whether to be treated in the VIP ward or in the cheaper Class III ward. In this market, absolutely, there is a market for production factors such as a doctor, a nurse, or a drug.

In the market, there are laws that are often used, such as demand and supply. The law of economic demand states: "When the goods price increases, the ceteris paribus quantity demanded by consumers for the goods decreases". The Ceteris paribus means that all other factors affecting the quantity demanded are considered unchanged [18]. The ceteris paribus condition in the hospital is actually difficult because it is impossible for all factors to be considered same. However, in understanding economics, the ceteris paribus definition needs to be used.

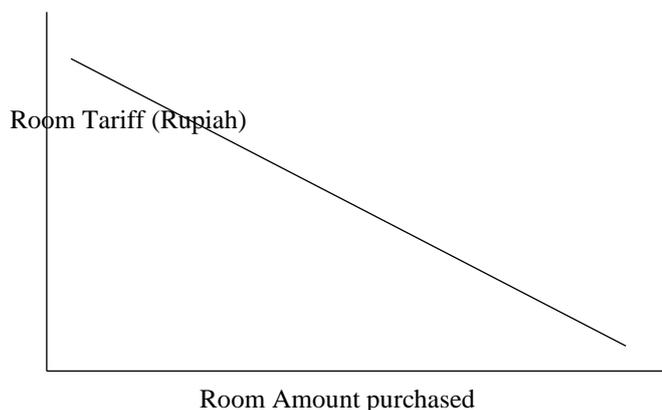
**4.1. Demand**

A market in the economic understanding has a demand and supply side. The demand side can be presented through the market demand table to show the goods or services amount purchased at each tariff level. For example, by simplifying the demand for VIP wards in a city is depicted in Table 5.1. According to this table, every year 12,000 rooms per day will be purchased by some patients if the tariff is IDR 500,000 per day, 13,000 rooms per day will be demanded if the tariff is IDR 450,000 per day, and so on.

**Table 1. Demand for VIP wards in city X.**

Hospital Room Tariff	The Room Demand
IDR 500.000,00	12.000
IDR 450.000,00	13.000
IDR 400.000,00	14.000
IDR 350.000,00	15.000
IDR 300.000,00	16.000
IDR 250.000,00	17.000
IDR 200.000,00	18.000

Another way in presenting this data is using a graphical market demand curve. The vertical axis shows the VIP ward tariff per room per day, while the horizontal axis represents the room requested per day. Figure 2 shows that the market demand curve for the VIP hospital ward based on Table 1.



**Figure2.** Market demand curve of VIP ward at city X

Two important things are shown in Figure2. First, the VIP ward demand curve is decreasing to the right. Second, this curve shows data. This period is important, because the demand data is very changeable.

A lot of factors could change the steepness position and degree of the demand curve. For example, some factors, that can influence the VIP ward demand (X), are: a VIP ward tariff (Px), patient test (S), patient income level (I), doctor influence (D), and other item's price (Py). In general, the demand function is an equation that shows the relationship between the demand amount for something and all the factors that influence it

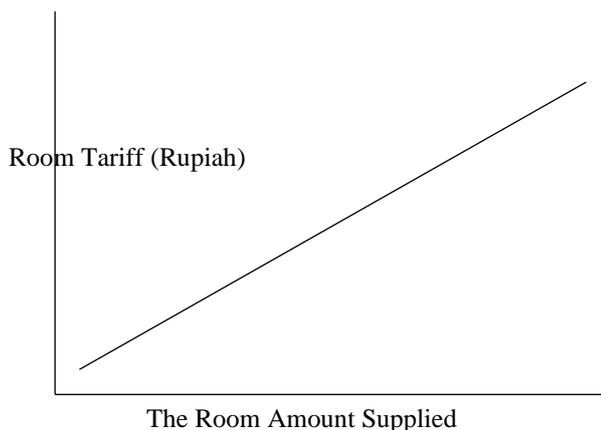
**4.2 Supply**

As the demand side, the supply side can be presented via a table to show the goods or services amount supplied at each tariff level. For example, by means of simplification, the bidding table for VIP ward in a city is shown in Table2. According to this table, each year, 18,000 rooms per day will be provided by the hospital if the tariff is IDR 500,000.00 per day, 17,000 rooms per day will be supplied if the tariff is IDR 450,000.00 per day, and so on.

**Table2.** VIP Ward Supply in City X

Hospital Room Tariff	The Supplied Room Amount
IDR 500.000,00	18.000
IDR 450.000,00	17.000
IDR 400.000,00	16.000
IDR 350.000,00	15.000
IDR 300.000,00	14.000
IDR 250.000,00	13.000
IDR 200.000,00	12.000

Another way to present this data is with a graphical market supply curve. The vertical axis shows the VIP ward room tariff per day, while the horizontal axis represents the room amount per day demanded. Figure3 shows the market supply curve for the VIP hospital ward based on Table2.



**Figure3.** Supply curve for VIP Ward in city X

Two important things are shown in Figure3. First, the VIP ward supply curve increases to the right. Second, this curve shows data. This period is important because supply data can change. Some factors can change the position and steepness degree of supply curve. For example, the

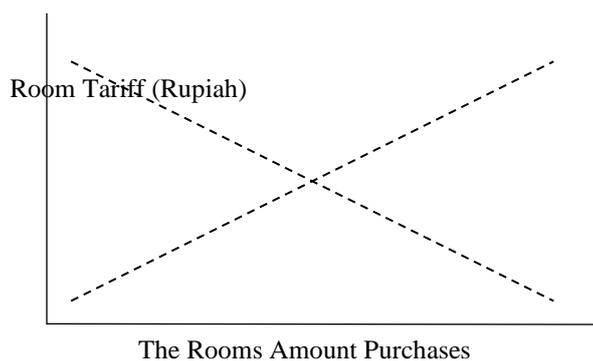
VIP ward supply is based on the input for development capital and operating activities and technology.

### 4.3. Equilibrium

A balance is a situation with no a change tendency. The price balance is a situation where the price can be maintained. The VIP ward data can be used to understand this. For example, if the VIP ward tariff per room per day is IDR 500,000.00. The supply curve will show that the hospital provided 18,000 rooms per day. Meanwhile, the demand curve will show that only 12,000 rooms were required by the public. There were an excess supply (supply) of 6,000 rooms per day. In this situation, the hospital felt that some VIP rooms were empty, or in other words the Bed Occupancy Rate (BOR) of VIP ward was very low. At this price level, the hospital will reduce the tariff so that it could fill the empty VIP ward. Thus, the tariff of IDR 500,000.00 per room per day cannot be maintained and it is not a balance tariff.

In other situations. for example, the VIP ward tariff per room per day is IDR 250,000. The supply curve will show that the hospital provided only 13,000 rooms per day. Meanwhile, the demand curve shows the 17,000 rooms that the public demanded. There was a lack of VIP wards of 4,000 rooms per day. In this situation, the hospital felt that a patient was rejected when entered the VIP ward because it was full. In this situation, the hospital can increase the tariff at the equilibrium.

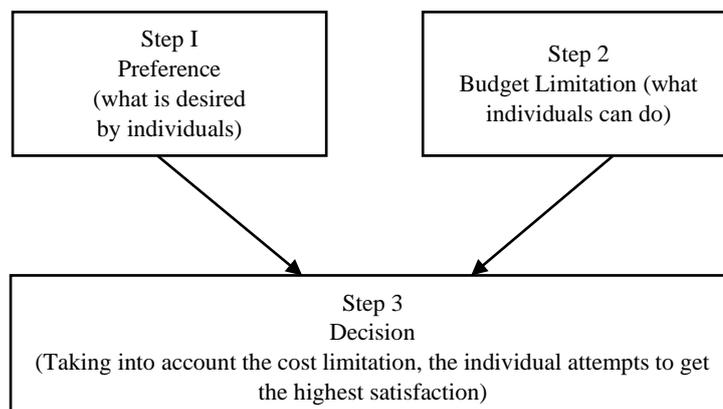
Thus, it can be stated that the equilibrium price is the price or tariff level, the quantity demanded is the same as the price offered. In Figure 5.4, the VIP ward tariff with the demanded amount are the same as those offered, amounting to IDR 350,000.00 rooms per day. This price is often referred to as the equilibrium point which can be drawn in the following graph.



**Figure4.** The price balance point of the VIP ward in X city

## 5. Household

The consumer or household behavior in spending money for shopping or giving their energy to work is the key in the circular flow model. Understanding consumer behavior is important to use in the health sector [19]. There are various things that can be used in the health sector. but there are also various things that are difficult to use.



**Figure 5. Individual Decision Making Model (Katz and Rosen 1998)**

To understand the consumer behavior, several steps need to be taken (See Figure 5), including:

1. It must be known what the consumer wants.
2. It must be known what the individual can do related to the income and the price it faces. This individual ability is influenced by the limited budget.
3. Analyzing the consumer desires (step 1) and budget limitation (step 2).

Step 1 deals with the taste with three assumptions. The first assumption is Completeness. The consumer can choose a service or goods over other alternatives. For example, if you are faced with two baskets, the first contains oranges and the second basket contains apples. In this case, the consumer may prefer the first basket to the second basket, or the contrary, or it has no choices [20]. The second assumption is Transitivity which means that the consumer choice is transitive. If someone prefers the orange to the apple, and prefers the apple to a durian, then the consumer will definitely choose the orange over the durian. The third assumption is non-satiation, in this case, the consumer always chooses more goods than less.

These assumptions are difficult to apply in the health sector. As an example, the desire to have surgery is the doctor's decision, not an individual. In addition, the non-satiation assumption will be difficult to apply in the health sector because no one wants to have surgery or drugs continuously. This will be discussed in more depth in Part III.

The second step is to understand the consumer's budget limitation, because (in life) the household will experience budget limitation. The household as the consumer is the price-taker meaning that these consumers have no control or influence over existing prices. Thus, the consumer has limited budgets because the income is limited and there are goods or services that must be purchased at a price set by another party [21]. By this understanding, if a person's income increases and the price of the desired goods stable, the ability to obtain these goods will be increased. Otherwise, if the price increases, a person's income is stable, then budget limitation will become tighter.

The behavior comparison between two balance points in the economic environment can affect the balance held by the consumer. For example, the economic crisis in Indonesia since 1997 has affected the consumer behavior. In this environmental change, there will be a behavior comparison between two points in time, before and after the change. In the health sector, there are two things that need to be discussed in the comparison between the two equilibrium periods, namely: (1) The price and income change, (2) the elasticity concept.

**6. Price, Income, and Elasticity**

Some important notes regarding the relationship between the price, income, and the elasticity concept change can be seen in the following information.

**Price and Income Change**

The price change: If the goods price decreases, and all factors are stable (*Ceteris Paribus*), then the quantity consumed will increase. This price change will increase the budget capacity.

**The goods price change**

If the goods price or service increases, it possibly affects the goods amount consumed. For example, the relation of heroin and methadone (heroin imitation). To reduce heroin consumption, the Hong Kong government provides methadone at a low price by 13 cents per dose. The addict behavior is interesting to observe. If the heroin price at the black market increases, the addict will fill the clinic that provides methadone.

In this case, there are three types of relations, such as, a substitute goods, complementary goods, and non-related goods. The substituted goods has the same characteristics to fulfill consumer satisfaction. The examples of heroin and methadone in Hong Kong are substitutes, which can substitute for one another. Another example, between tea and coffee, between the Toyota Corolla and the Honda Civic. In the health sector, the shaman services can be a substitute for the medical service.

The complementary goods means these goods must be used simultaneously to meet consumer satisfaction. The price increase of one goods will reduce the demand for the complementary goods [22]. For example, The gasoline and other fuels price increase could reduce the demand for cars. In the health sector, the VIP class operating tariff can reduce the demand for the VIP hospital room. The unrelated goods means that the price increase of one good has no impact on the demand for other goods.

### **The Income Change**

When people are broke, the first thing they give up are books. This shows that if a person's income decreases, there will be a demand decrease for an item. Conversely, if the income increases, then the goods consumption also increases. This happens to items that have a normal good predicate. The book is the normal goods. In addition, there are goods with the inferior good, which is the opposite of normal good. If a person's income increases, then the consumption of inferior goods will decrease. In daily reality, one of the inferior goods is cheap rice or "*bulgur*" which is eaten during difficult times.

In the health sector, a low quality government-owned hospital can be an inferior item that might only be used by the poor with no choice. When the income increases, the government-owned hospital will be abandoned instead consuming a better quality private hospital. Another example, in various Medical Centers (BP) Public Health Center (Puskesmas) can actually be classified as inferior goods. Various observations indicate that the user of BP Puskesmas is the poor. If their wealth has increased, the poor possibly will leave the BP Puskesmas to seek the better service.

There are three cases of decreasing demand that are not applicable, such as, the Giffen case for inferior goods, the speculation, and the prestige goods. The Giffen case shows an anomalous situation, such the price increase of inferior goods X which actually increases the X goods quantity demanded by consumers. The speculation case occurs when the consumer hopes that the goods price tomorrow will increase again, then the price increase today can be followed by a demand increase for these goods today. This is very common in the stock market.

For health, this speculation case is very rare. The prestige item case can occur in the certain item, for example used gems belonging to famous people. The price increase can be followed by the demand increase. In the health sector, there are various services and goods that are synonymous with prestige. For example, the sense of prestige increases when treated by a well-known doctor. It is possible that the doctor will increase the tariff, but it is followed by the demand increase and the contrary. Likewise, if the VIP ward had an increased price, it turned out that the demand would increase.

### **Elasticity**

In measuring the change between two moments, another important thing that needs to be discussed is the elasticity concept. Elasticity is a sensitivity degree measure on the request amount to changes in one of the factors that influence it. Several kinds of elasticity concepts related to demand are price elasticity and income elasticity.

### **Price Elasticity**

If the VIP ward price is increased by 50%, Do the VIP ward users also decrease by 50%, 10%, or 75%? This question is very important, especially for the consumer with limited budgets. It is possible that the consumer would move to class I, class II ward, or use other hospital VIP wards that are not increasing the tariff, *ceteris paribus*. This percentage change comparison produces the price elasticity concept as measured by the following formula.

$$\epsilon_h = (-) \frac{\text{the demanded percentage change amount}}{\text{the goods price percentage change}}$$

The negative sign (-) use in front of the comparison is to avoid the negative result because with the normal goods demand law, if there is the price increase, there will be the demand decrease for the goods.

If  $\epsilon_h > 1$  it means the elastic demand. In this case, the demand decrease percentage is greater than the price increase percentage. It can be stated that the goods demand is very responsive on the increase so that the total public expenditure for these goods decreases.

If  $\epsilon_h < 1$  it means the inelastic demand. The quantity demanded is not responsive on the price increase. The demand decrease percentage is smaller than the price increase percentage. As a result, the consumer would spend more money on these inelastic goods. The middle form of elasticity is the single elasticity (unit elastic) represented by  $\epsilon_h = 1$ , which means that the single elasticity is the equal price increase percentage with the demand decrease percentage.

### Determinants of Price Elasticity

Several factors that determine price elasticity are as follows:

1. The substitutes existence tends to encourage the elastic goods. For example, people think of the Honda Civic as a close substitute for the Toyota Corolla. If the price of the Toyota Corolla increases, a lot of consumers will buy the Honda Civic, *ceteris paribus*. Thus, the Toyota Corolla price is quite elastic. The Health service products are usually inelastic, especially for the acute treatments with no substitute for them. The inelastic situation will be even stronger if there is a monopoly on the health services supply without any substitute products.
2. The Elasticity depends on how the fraction item budget set by the consumer. In general, the smaller income fraction used to buy these goods, the smaller elasticity tends to be, *ceteris paribus*.
3. The price elasticity depends on the analysis time. This time is very important to note. For example, one week after the VIP ward price increase, elasticity measurements were taken. The results will differ if the measurements are retaken after the next two months. It is possible that the elasticity will be less when people are accustomed to the new price. Another example, the gasoline price elasticity in the first year was 0.11 (Poterba, 1991). In the horizon for the next five years, the price elasticity became 0.49, and ten years later it became 0.89. Thus, the increasing the fuel tax policy continuously makes the gasoline more elastic. This means that there will be some savings in gasoline.

#### a. Cross (Price) Elasticity

The elasticity principle also applies to the substitute goods and complementary goods. The cross price elasticity for the goods Y demand on the price changes of goods Z is the demand change percentage for the goods X due to the price change percentage of goods Y. In general, it is stated by the following formula:

$$\epsilon_{xy} = \frac{\text{the demand change percentage for the goods X}}{\text{The price change percentage for the goods Y}}$$

As a note, unlike the price elasticity, there is no negative sign in the formula  $\epsilon_{xy}$ . The cross price elasticity can be positive or negative because it would sign the relation types between the goods X and Y. If X and Y are substitutes, the goods Y price increases, then the consumption of goods X will increase so that  $\epsilon_{xy}$  will be positive, whereas if X and Y are complement, then  $\epsilon_{xy}$  will be negative. For unrelated items then  $\epsilon_{xy}$  will be 0.

#### b. Income Elasticity

The elasticity concept can be used to assess the change impact at a person's income on the goods consumption. The income elasticity is defined as the demand change percentage for an item related to the consumers' real income change. In general, expressed by the following formula.

$$E_I = \frac{\text{the demand change percentage for the goods X}}{\text{The real income change percentage}}$$

Such the cross price elasticity, the income elasticity can be positive or negative. For the normal goods,  $E_I$  is positive, and for inferior goods,  $E_I$  is negative. The basic necessity usually has  $E_I < 1$ , while for non-basic necessity (for example luxury goods)  $E_I > 1$ . The Luxury goods has an attractive feature, for example, the income increase percentage is related to the goods consumption percentage with the bigger amount.

### 7. Household as Energy Supplier

From year to year, the male medical students has been decreasing. In 1980, the male student at Faculty of Medicine was around 60%, while in 2000 it decreased to around 40%. Why does it decrease? is the woman getting smarter so they can pass the very difficult State University Entrance Examination? Or the man were not willing to be a doctor because this job is not economically attractive? In the 1980s, the income tax was drastically lowered in various countries. The United States lowered the maximum tax from 70% to 33%, the UK from 83% to 60%; and Sweden from 50% to 20%. This tax reduction aims to stimulate, grow, and develop the economy. In more detail, this policy is expected to encourage the people working harder to stimulate the economic growth.

The cases above show that the household, as in the Circular Flow model, supplies the power and the model for a production. This power supply will depend on the preference and the available budget in the economy. For example, if the medical profession does not promise a sufficient income, there will not be interested to be a doctor. The household prefers to provide the energy for other jobs so that the desire to be a doctor in a hospital will decrease. In this case, the power supply curve concept that connects the energy amount supplied by the income occurs. This is the doctor labor market basis and it has been proven by the lack of doctors in some areas with a low economy.

### 8. CONCLUSION

In general, the hospital sector has solved various basic economic problems through medical treatment habits, doctor orders or suggestions, funder regulations, for example AskesIndonesia,Ltd; and the tariff mechanism in the hospital market. These activities obviously require an economics understanding, especially microeconomics.

Until nowadays, the health sector in Indonesia is still dominated by the normative statement, for example "the poor's service must be a high quality and these poor patients do not require to pay". Meanwhile, the positive statement is: "the Government-owned hospital service will be low quality if the poor do not pay and there is no sufficient subsidy from the government." In practice, it often occurs that the normative statement is forced to regulate the real world without caring any more the positive statement containing cause and effect. As an illustration, in a local government-owned hospital in which the operational cost subsidies are low. The doctors tend to earn more in a private hospital. As a result, the quality of government-owned hospital service has decreased. Meanwhile, the Regional House of Representative (DPRD) members normatively do not want a high tariff while they also do not approve the large Regional Budget (APBD) for the hospital.

By realizing that there are normative statements that may not be applicable in the real world, the health worker rightly learns economics to be applied at the health sector. Basically, the application of economics in hospitals can be learned through various models based on the tariff system, such as: (1) the Circular Flow Model of Katz and Rosen (1998), and (2) the demand and supply model.

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