

## **A STUDY OF INVESTMENT LOSS ON PUBLIC SERVICE PROVIDING**

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**ABSTRACT:** Recently, many local governments in Japan are facing financial crisis. Local governments have role of many kinds of service providing, such as construction, social welfare and education etc. Loss of public service delivery should be minimized. But Local governments in Japan don't have assessment tool for their service providing. Therefore, oversupply and loss of investment may occur in public service providing. Local governments in Japan are required to become independent under the decentralization policy of central government. But it is difficult for present local governments to provide efficient and effective public service by themselves.

In this research, nursing care service taking as an example of public service providing was studied. Excessive investment for nursing care service by oversupply and dead weight loss were investigated in demand and supply curve. Investment loss was simulated in the model developed in this study and some recommendations for reducing investment loss are proposed.

**KEYWORDS:** Loss on Public Service Providing, Demand and supply curve, Nursing Care Insurance

### **1. INTRODUCTION**

Central government and local governments in Japan are facing financial crisis. Many Japanese people criticize prevailing extensive public works as a cause of financial crisis. Figure 1 shows changes of public investment and social security cost in Japan. Social security cost has been increased constantly, and is as three times as public investment in 2005. So, cause of financial crisis is a chain reaction of increased social security cost incurred due to aging society, increased public investment for keeping amount of employment, and reduced tax revenues from low economic growth. In this situation, loss of public service delivery should be minimized.

Purposes of this study are following.

- i) Is to investigate loss on public service providing, using easy economical model.
- ii) Is to assess effect of some recommendations for reducing investment loss.

In this study, nursing care service was taken as an example of public service providing. The reasons are as following.

- i) Figure 2 shows changes of nursing care cost in Japan. Burden for nursing care was estimated to increase rapidly. Nursing care cost has been estimated about 20 trillion JPY in 2025. This amount

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is same as the present public investment.

- ii) In Japan, insurer of nursing care service is local government. So, the model developed in this study is useful for another kind of public service providing in order to improve public management system.

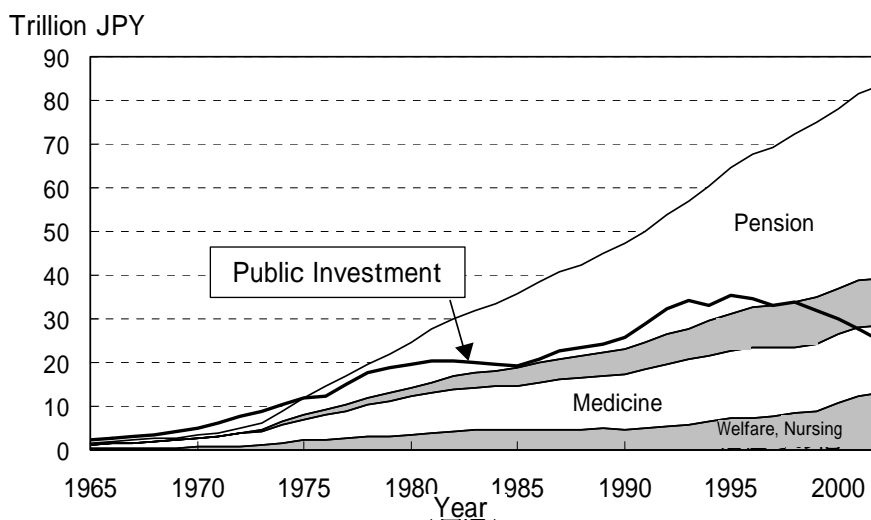
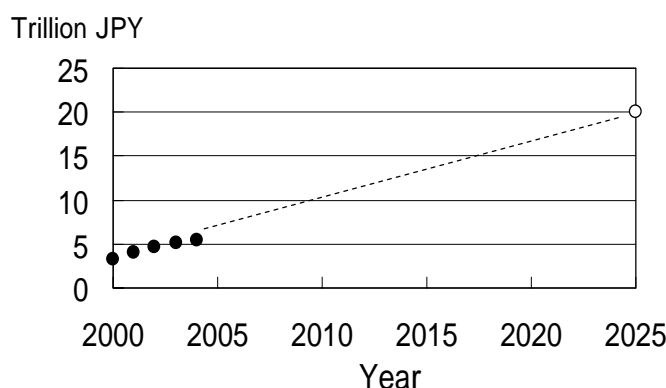


Figure1. Changes of public investment and social security cost in Japan



Source: Ministry of Health, Labor and Welfare  
<http://www.mhlw.go.jp/shingi/2004/03/s0324-7d.html>

Figure 2. Changes of nursing care cost in Japan

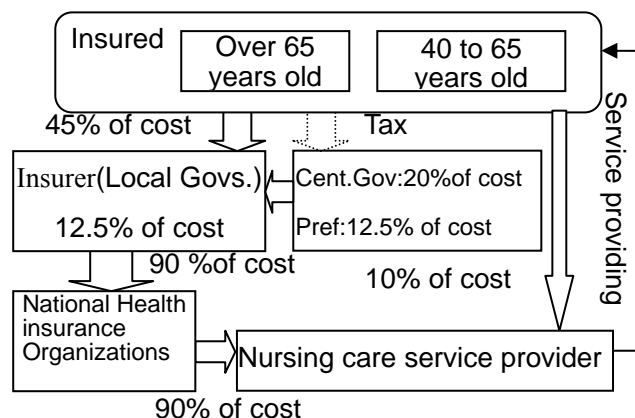


Figure 3. Nursing care insurance system in Japan

## 2. NURSING CARE SERVICE PROVIDING SYSTEM IN JAPAN

Nursing care insurance is compulsory insurance for every Japanese people of over 40 years old. Figure 3 shows burden and benefit of nursing care insurance system in Japan. Every people of over 40 years old are insured. Insurers are municipality level local government, and they levy premium. Price of premium is decided by each insurer, extent of price of premium is from 2,000 JPY to 5,000 JPY per month. Central government and prefectural governments pay part of service providing cost for insurer according to the rules. By above system, insurers keep source of fund to provide nursing care service. Designated insured people who need nursing care can get nursing care service from service provider by 10% of total cost. Remaining 90% of total cost is paid from insurers to service provider through National Health Insurance Organizations. Service contents and price are fixed by the central government uniformly.

### 3. MODEL OF DEMAND-SUPPLY ANALYSIS OF NURSING CARE INSURANCE SYSTEM

In this study, investment loss on nursing care insurance system is classified in following kind of loss.

#### 3.1 LOSS CAUSED BY FIXED UNIFORM PRICE

Figure 4 shows model of demand and supply curve and fixed nursing care service price. Before introducing nursing care insurance system, point F was equilibrium. Amount of service supply was  $q_0$ . However,  $q_1'$  is estimated amount of nursing care service providing for aging society. To increase supply, selling price for service provider is fixed in  $p_1'$ . To increase demand, purchase price for customer is fixed in  $p_1$ . To realize above measure, public fund is necessary. Necessary public fund is same as area of square  $p_1'BCp_1$ . Increased social surplus is the area  $p_1'BFcp_1$ . Dead-weight loss is Figure FBC.

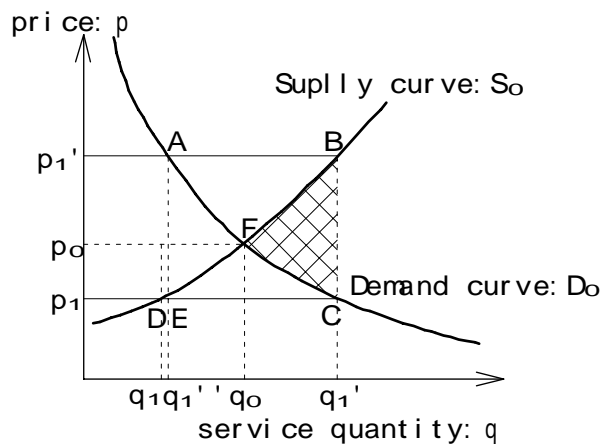


Figure 4. Demand and supply curve and fixed service price

#### 3.2 LOSS CAUSED BY FIXED INAPPROPRIATE FIXED PRICE

Figure 5 shows model of demand and supply curve and loss caused by inappropriate fixed price. Generally, demand and supply curve is not clear. So, actual selling price and customer price are not priced as appropriate selling price  $p_1'$  and customer price  $p_1$  to maintain  $q_1'$  supply. In that condition, pricing procedure of selling and customer price were as following.

1. Actual selling price  $p_2'$  was priced rather high than  $p_1'$  by opinion of providers.
2.  $p_2$  is calculated from ratio ( $\alpha$ ) of customer's share to the whole expenses required for the service.  $\alpha$  is usually fixed low level by politician from the opinion of residents. So, actual customer price  $p_2$  is priced rather low than  $p_1$ .

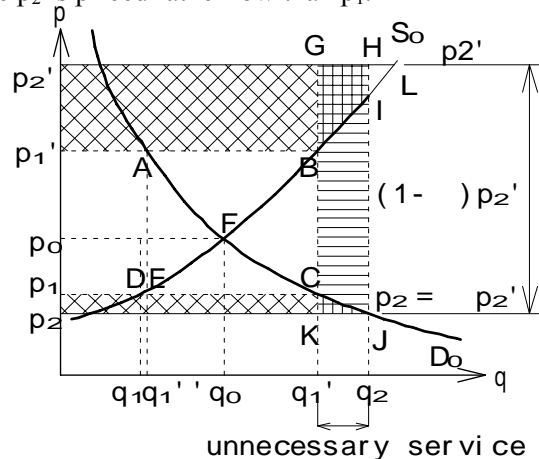


Figure 5. Demand and supply curve and inappropriate fixed price

By this pricing method, demand and supply are increased from  $q_1'$  to  $q_2$ . Necessary public fund for this pricing is area of square  $p_2'HJp_2$ . Dead weight loss is area of figure  $FBC$  and  $BIJC$ .

Area of figure  $p_2'HIBp_1'$  and figure  $p_1CJp_2$  have increased social surplus. However, these surpluses are made from overproduction ( $q_2-q_1$ ) and inappropriate fixed price ( $p_2'-p_1'$  and  $p_2-p_1$ ). Loss of public service delivery should be minimized in circumstance of financial crisis. Local governments don't have enough funds to provide too much service. So, these surpluses increasing are unnecessary.

### 3.3 INDIRECT FACTOR OF MAKING LOSS OR OVERPRODUCTION

Figure 6 shows supplier-induced demand. Customer's demand for service amount is  $q_2$ . If service providers provide  $q_2'$  service, they can get more benefit (figure  $IHL$ ). So, they have incentive to provide more service. There is difference of knowledge level about nursing care service between customer and service provider. If  $q_2'$  service was provided, customer might not aware of their loss (figure  $JMN$ ). Furthermore, dead weight loss (figure  $ILMJ$ ) would be occurred.

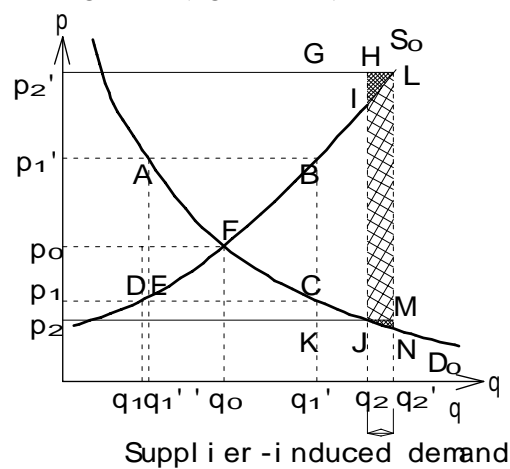


Figure 6. Supplier-induced demand

## 4. MEASURES FOR REDUCING NURSING CARE COST

### 4.1 DIFFERENCE BETWEEN GERMAN AND JAPANESE NURSING CARE SYSTEM

Nursing care system in Germany was referred to establish Japanese nursing care insurance system. However, some differences are pointed out as following.

- i) In Germany, price of nursing care service is decided by each insures. The other hand, in Japan, price of nursing care service is decided uniformly by the central government.
- ii) In Germany, Insured people can select either getting cash or actual nursing care service. Insured people who select to get cash, payment is as half as upper limit cost of actual service. However, in Japan, insured people cannot select to get cash.

Table 1 shows percentage of different nursing care services provided in Germany. 56% insured people selected to get cash. The other hand, only 7% insured selected for actual service. This system has a function to reduce nursing care cost by providing incentive for insured people.

**Table 1. Percentage of provided nursing care service in Germany <sup>5)</sup>**

Service		(%)
Home Care	Actual service	7
	Cash	56
	Combination	10
Care facilities		25
Others		2

**4.2 INTRODUCTION OF CASH PAYMENT SYSTEM**

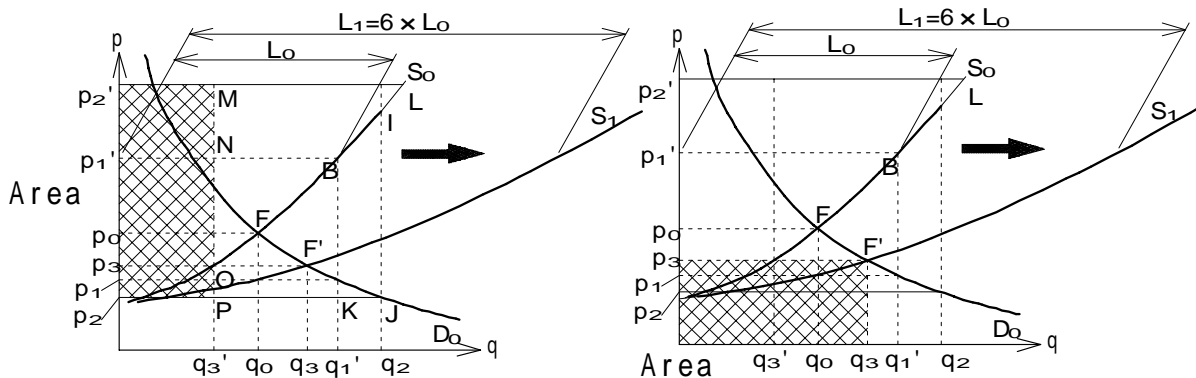
In Germany, amount of payment alternative to the actual nursing service is decided as half as upper limit cost of actual nursing service. In reference to the table.1, about home care service, approximately 1/4 insured people select to get actual nursing service, remained 3/4 select to get cash. Ratio of service cost is as following.

$$\text{Cash : Actual service} = 3 : 1$$

Supposed that cost of nursing care service by family is as half as by service provider, ratio of nursing care service amount will be,

$$\text{Cash : Actual service} = 6 : 1$$

Figure 7 shows enlarged supply curve and public investment by introducing cash payment system.  $S_0$ , supply curve  $S_1$  that is case of service providing by family is enlarged as 6 times as  $S_0$ . Point  $F'$  is equilibrium of  $D_0$  and  $S_1$ . Service amount  $q_3$  is provided by family. Amount of provider's service is  $q_3'$ .  $q_3'$  is 1/6 of  $q_3$ . Public investment to provide actual service is area , to pay cash is area ,



**Figure 7. Enlarged supply curve and public investment by introducing cash payment system**

**4.3 INTRODUCTION TO MARKET MECHANISM**

By introducing market mechanism, service provider can decide their service charge by themselves. If service price of each provider is different, insurer has to pay the cost as per their claim based on rule shown in Figure 3. If a provider decides high price to get high profit, but this provider loses consumer's support. In this way, competition is accelerated. Figure 8 shows shift of supply curve and public investment under market mechanism. To keep service amount  $q_1'$ , Supply curve should be moved from  $S_0$  to  $S_1$ . Necessary public investment is area and . Area is investment loss.

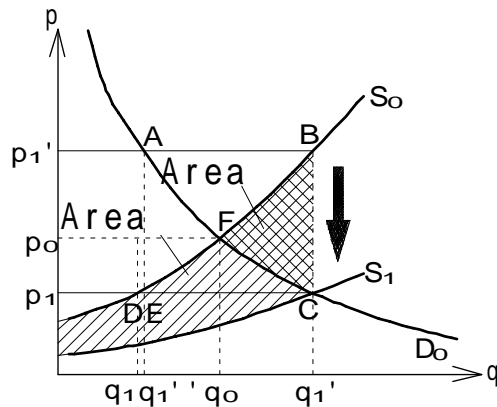


Figure 8. Shift of supply curve and public investment

## 5. CASE STUDY

### 5.1 DEMAND-SUPPLY CURVE OF NURSING CARE SERVICE CASE STUDY

Demand curve is made from data of actual service provided. Number of nursing care service user, each user's level of care needed and amount provided for each nursing care service were found out from local government's data. Supply curve is made from a report on final accounts of nursing care service provider. Fixed cost and variable cost were found out from service provider's data. Figure 9 shows demand-supply curve of nursing care service (home care service) in a local government in Japan.

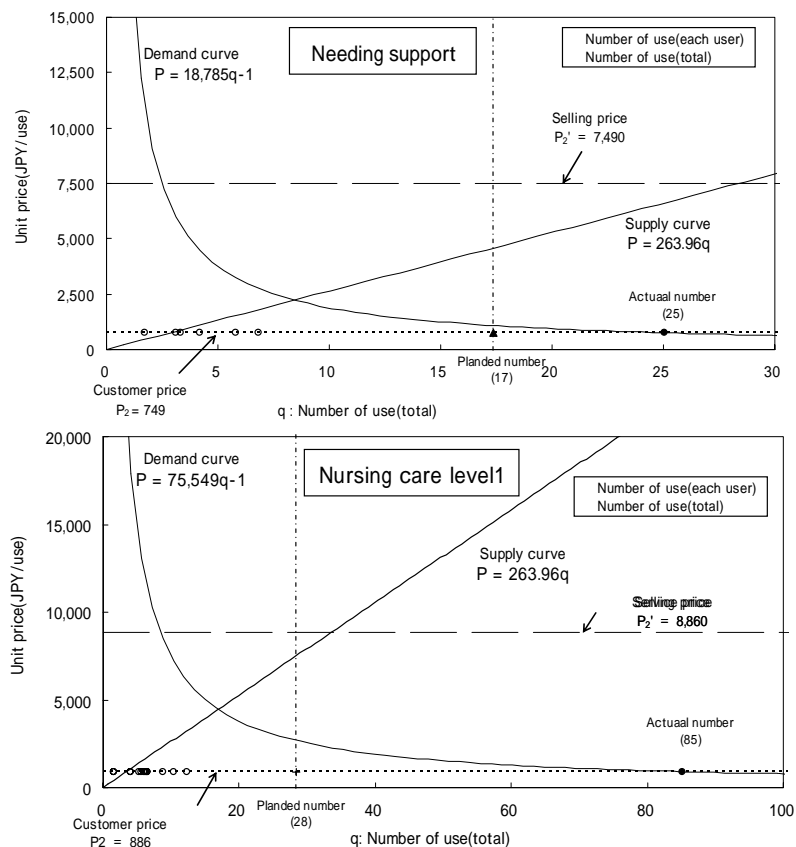


Figure 9. Demand-supply curve of nursing care service

## 5.2 EFFECT OF MEASURES FOR REDUCING NURSING CARE COST

By using demand-supply curve on figure 9, loss of investment on present case and other 3 cases listed below were assessed.

- i) Present case
- ii) Liberalize to decide service price by each insurer
- iii) Introducing cash payment system
- iv) Introducing market mechanism

### (1) Assessed issue

#### Total public investment

Following areas of Figures were estimated.

- Present case  
Square  $p_2'HJp_2$  on Figure.5
- Liberalize to decide service price by each insurer  
Square  $p_1'HJp_1$  on Figure.5
- Introducing cash payment system  
Area and area on Figure.7
- Introducing market mechanism  
Area and area on Figure.8

#### Increased social surplus caused by oversupply

Following areas of Figures were estimated.

- Present case  
Square  $p_2'HIBp_1'$  and  $p_2'Jcp_1$  on Figure.5
- Liberalize to decide service price by each insurer  
If pricing is done appropriately, oversupply is not occurred.
- Introducing cash payment system  
Square  $p_2'MNp_1'$  and  $p_1'OPp_2$  on Figure.7
- Introducing market mechanism  
If pricing is done appropriately, oversupply is not occurred.

#### Loss of investment

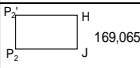
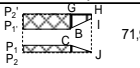
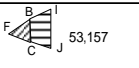
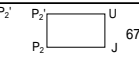
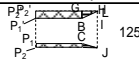
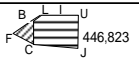
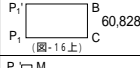
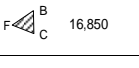
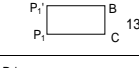
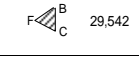
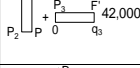
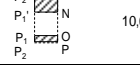
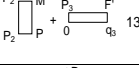
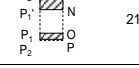
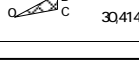
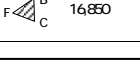
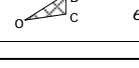
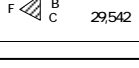
Following areas of Figures were estimated.

- Present case  
Figure BCJI and figure FCB on Figure.5
- Liberalize to decide service price by each insurer  
Figure FCB on Figure.5
- Introducing cash payment system  
Loss is not occurred on Figure.7
- Introducing market mechanism  
Area on Figure.8

Each assessed issue is shown in Table.2.

Table 2. Loss of investment on each case

(Unit:JPY)

Measures	Needing Support			Nursing care level1		
	Total public investment	Increased social surplus caused by oversupply	Loss of investment	Total public investment	Increased social surplus caused by oversupply	Loss of investment
Present case	 169,065	 71,930	 53,157	 679,941	 125,301	 446,823
Liberalize to decide service price by each insures	 60,828	0	 16,850	 137,360	0	 29,542
Introducing cash payment system	 42,000	 10,602	0	 130,621	 21,669	0
Introducing market mechanism	 30,414	0	 16,850	 68,680	0	 29,542

## 6. CONCLUSION

In this study, total public investment, increased social surplus caused by oversupply and loss of investment on 4 different cases regarding actual nursing care services were assessed. Introducing proposed measures for nursing care cost would be effective. By these measures, nursing care cost would be reduced. In this research, nursing care service was studied by taking as an example of public service providing. This research can be equally applicable to other kinds of public services.

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