# Hospital bad debt in Japan
# –based on health economics analysis-

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# Purposes

* Purpose: to examine the effects of hospital bad debt on healthcare system in Japan
* Following three questions would be answered ideally

  1 The effects of bad debt on physicians' behavior
  2 The effects of bad debt on patients 'behavior
  3 The effects of bad debt on hospital management

  In this paper I will focus on how bad debt affect hospital management (=financial behaviour)

# Introduction and background

* Health expenditure is increasing steadily in Japan

* Every Japanese and foreigners who are living in Japan have been covered by social health insurance

* Several features of the health care delivery system in Japan

  1 Fee-for-service based on the official fee schedule

  2 Free access

  3 Relatively low out-of-pocket expense

# Introduction and background

* Main issues of Japanese public hospital management

  1 Deficit operation

  2 Cost containment (to reduce LOS)

  3 Medical staff shortage

  4 The issue of medical staff over work

  5 Lower reimbursement caused by changing
    of payment system

# Introduction and background

Further ...

* Japanese hospitals also face another problem of increasing bad debt in recent years .

* Bad debt is defined as services rendered to patients who had the ability to pay, as determined by the hospital ,but didn't pay.

* Bad debt is belong to uncompensated care but is not equal to charity care as we known

# Hospital bad debt in Japan

* The JHA (Japanese hospital association) made a survey in 2012 to calculate how many bad debts hospital holds in Japan (from March 2011 to April 2012 )

* The survey showed bad debt in Japan

* On average  one hospital had 11.08million yen (from March 2011 to April 2012 ) o.62% of gross hospital revenues

# The data of Hospital bad debt

One hospital had bad debt(compare to previous survey)

* 2006 survey  7.15million yen
* 2010 survey  5.48million yen
* 2012 survey  11.08million yen

In 2012,bad debt that one hospital had growth rate more than doubled over the 2010 year

Hospital bad debt increases every year in Japan. Why?

Even if patients have no willing to pay any co-payment ,physicians have to provide care treatment for the patient because of Japanese legal restriction.

# The data of Hospital bad debt

* Important issues for public policy maker
  ①To clear the magnitude of hospital bad debt
  ②To determine how bad debt affect Japanese healthcare system

  But

* Except to a few surveys about how many bad debt occurred in Japan

* No previous studies that determine how hospital bad debt affect hospital management and physicians behavior

* No related studies about hospital bad debt

# Related studies in US

* Key words

  1 Uncompensated care

  ①charity care

  ②hospital bad debt

  2 Cost shifting

  3 Cost cutting

  4 Collection effort

# Related studies

* Two aspects of uncompensated hospital costs are arguable.

<span style="color:green">Charity care</span>

being provided to patients who are given free or discounted care because <span style="color:red">hospitals determined</span> they were unable to pay.

<span style="color:green">Hospital Bad debt</span>

being generated when patients who are considered to be able to pay by hospital does not pay it.

# Related studies

* What strategy will be take by hospitals when bad debt occurred in US?

* Three main strategies

  1 Cost-shifting

  2 Cost cutting

  3 Included in charity care costs

# Cost shifting

By charging private payers more in response to shortfalls in public payments  (Medicare and Medicaid )and to offset the cost of uncompensated care

*How much cost shifting

Dranove(1988) found

A one dollar decrease in hospital profits from government sources per admission led to fifty –one –cent increase in price per private admission.

Health insurance industry-funded report (PWC2009) assumed

dollar for dollar

Wu(2009) using 1996 and 2000 Medicare hospital cost report  to estimate

On average , hospital shifted twenty-one cents of each Medicare dollar lost to private payers

# Cost cutting

Cost cutting is another responses to shortfall in public payments to hospital (Austin Frakt 2011)

* For example :cutting services and staff

# Included in charity care

* **Included in charity care**

  Hospitals include bad debt in charity care when they report their level of charity care to government agencies or get reimbursement  from uncompensated  care trust Fund

* **Minimum charity care requirements**

* Non-profit hospitals (NPH) are given federal funding and tax-exemption in exchange for providing a reasonable volume of service to person unable to pay (charity care)

  For example: In Texas sates NPH must provide charity care equal to 4% of the hospital patient revenue, excluding bad debt (Texas Department of State Health Services 2005)

# Included in charity care

## However

When NPH report their level of uncompensated care to government agencies ,it is common for them to also <span style="color:red">combine bad debt</span>

## Debate

Whether hospital should be allowed to include bad debt when calculating their level of charity care

# Because

Substantial difference between offering a patient free care from the start and declaring care to be free only after the hospital (and collection agencies) <span style="color:red">have been unable to collect payment</span>

Organizations like the Catholic Health Alliance argue that bad debt <span style="color:red">should be excluded</span> when calculating charity care (Catholic Health Alliance 2005)

# Included in charity care

**Uncompensated Care Trust Fund**

The Fund to offset the costs of uncompensated care and inducing hospitals to increase their provision of uncompensated care

Evidence from studies of New York state s revenue pools suggests that such Fund induces hospitals to provide more uncompensated care (Darrell 1997)

## However

Presumably ,When hospital are reimbursed for bad debts ,they have less incentive to collect from patients who may be able to pay for services (1996 Darrel J.Gaskin)

While bad debt is not widely argued in Japan,

it seems to be necessary to study what strategy will be taken by Japanese hospital to offset bad debt cost.

However, there is no investigation of any impacts on hospital management and behavior due to data limitation.

So, we try to access finance data of nationwide public hospital in 2010 to analyze

# Assumption for analysis and purposes

When Japanese Hospital face risk of financial loss by bad debt, their priority of employing tactics may be

Cost shifting> subsidization>cost cutting

The Purposes of analysis

1)To test whether our assumption above may be reasonable

2)To estimate any impacts of occurrence of bad debt on hospital financial behaviors

# Database and estimation equations

Micro data of financial condition extracted from **654public hospitals profit-loss statement data base in Japan** . One year cross-section data set of 2010
After screening of missing values ,511hospital data had remained for analysis.

Three dimensions of hospital cost function
- Cost shifting behavior

$$lnY = α_0 + \sum βiXi + \sum γiψi + K + ε$$
- Subsidization behavior

$$S = α_0 + \sum βiXi + \sum γiψi + K + ε$$
- Cost cutting behavior

$$C = α_0 + \sum βiXi + \sum γiψi + K + ε$$

where
Y      hospital income in 2010 fiscal year
S      an amount of subsidization
C       the cost which should be cut
X  and ψ  indicate a vector of profit-loss related indices respectively
k      dummy variables related to regional characteristics,
ε      error term which assuming  $σ^2$   is zero

# Tabel1 variable explanation

| variables | item name in original database |
|---|---|
| In total amount of bad debt per hospital bed | Special loss account : deflated by no.of hospital bed |
| subsidization ratio per medical revenue | Subsidization ratio per medical revenue |
| In inpatient income per patient | Inpatient income : deflated by no.of inpatients |
| In outpatient income per patient | Outpatient income per outpatients |
| In hospital income per physician | Hospital income per physician |
| In hospital income per nurse | Hospital income per nurse |
| ratio of personal expense per total revenue | Ratio of personal expense per total hospital revenue |
| ER setting Dummy | Preparing special services of emergency treatment |
| nurse-patient ratio standard Dummy | Nurse- patints ratio standard |
| Hokkaido Dummy | Regional dummy |
| Tohoku Dummy | Regional dummy |
| Kanto Dummy | Regional dummy |
| Chubu Dummy | Regional dummy |
| Kinki Dummy | Regional dummy |
| Chugoku-Shikoku Dummy | Regional dummy |
| Kyushu Dummy | Regional dummy |
| metropolitan Dummy | Cities over million people |

# Results

* Descriptive statistics is appeared on table 2, and the result of parameter estimation in three equations is shown on table 3.

| Table2 Descriptive statistics | | | | | | |
|---|---|---|---|---|---|---|
| variables | n | average | mean square | SD | min | max |
| ln total amount of bad debt per hospital bed | 511 | 0.920 | 0.074 | 0.272 | 0.000 | 1.000 |
| subsidization ratio per medical revenue | 511 | 0.346 | 0.227 | 0.476 | 0.000 | 1.000 |
| ln inpatient income per patient | 511 | 3.379 | 3.505 | 1.872 | -3.738 | 7.835 |
| ln outpatient income per patient | 511 | 19.498 | 279.176 | 16.709 | 0.900 | 134.800 |
| ln hospital income per physician | 511 | 10.411 | 0.157 | 0.396 | 9.145 | 11.839 |
| ln hospital income per nurse | 511 | 9.171 | 0.168 | 0.410 | 8.247 | 13.536 |
| ratio of personal expense per total revenue | 511 | 12.679 | 0.085 | 0.292 | 10.522 | 14.501 |
| ER setting Dummy | 511 | 10.889 | 0.103 | 0.320 | 8.653 | 14.096 |
| nurse-patient ratio standard Dummy | 511 | 59.464 | 288.240 | 16.978 | 0.100 | 166.600 |
| Hokkaido Dummy | 511 | 0.094 | 0.085 | 0.292 | 0.000 | 1.000 |
| Tohoku Dummy | 510 | 0.2078 | 0.4062 | 0.165 | 0.000 | 1.000 |
| Kanto Dummy | 510 | 0.1118 | 0.3154 | 0.099 | 0.000 | 1.000 |
| Chubu Dummy | 510 | 0.1706 | 0.3765 | 0.142 | 0.000 | 1.000 |
| Kinki Dummy | 510 | 0.1451 | 0.3525 | 0.124 | 0.000 | 1.000 |
| Chugoku-Shikoku Dummy | 510 | 0.1373 | 0.3445 | 0.119 | 0.000 | 1.000 |
| Kyushu Dummy | 510 | 0.1353 | 0.3424 | 0.117 | 0.000 | 1.000 |
| metropolitan Dummy | 511 | 0.166 | 0.139 | 0.373 | 0.000 | 1.000 |

# Table3 estimation result in OLS regression

| Table 3    Estimation result | Equation1-1 | | | | Equation1-2 | | | | Equation2 | | | | Equation1 | | | |
| | cost shifting - inpatient tr. | | | | cost shifting - outpatient tr. | | | | subsidization | | | | cost cutting | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| variables | β | SE | p value | | β | SE | p value | | β | SE | p value | | β | SE | p value | |
| In total amount of bad debt per hospital bed | 0.0200 | 0.0055 | 0.0003 | ** | -0.0074 | 0.0070 | 0.2870 | | 0.2860 | 0.2820 | 0.3108 | | 0.4222 | 0.3412 | 0.2164 | |
| In hospital income per physician | -0.2850 | 0.0414 | 0.0000 | ** | 0.1485 | 0.0520 | 0.0045 | ** | -2.9046 | 2.1152 | 0.1703 | | -9.7649 | 2.5259 | 0.0001 | ** |
| In hospital income per nurse | 0.5463 | 0.0431 | 0.0000 | ** | 0.6961 | 0.0530 | 0.0000 | ** | -1.2080 | 2.2007 | 0.5833 | | -24.0807 | 2.4409 | 0.0000 | ** |
| ER setting    Dummy | 0.0846 | 0.0383 | 0.0276 | * | -0.3053 | 0.0473 | 0.0000 | ** | -8.2342 | 1.9567 | 0.0000 | ** | -5.2836 | 2.3593 | 0.0256 | * |
| nurse-patienr ratio standard Dummy | 0.3511 | 0.0230 | 0.0000 | ** | 0.1884 | 0.0291 | 0.0000 | ** | 0.4801 | 1.1727 | 0.6824 | | -4.1921 | 1.4087 | 0.0031 | ** |
| Hokkaido Dummy | 0.0009 | 0.0349 | 0.9787 | | 0.0125 | 0.0536 | 0.8156 | | 11.4761 | 1.7811 | 0.0000 | ** | 2.6534 | 2.1550 | 0.2188 | |
| Tohoku Dummy | -0.0359 | 0.0252 | 0.1550 | | -0.0642 | 0.0438 | 0.1435 | | 1.5819 | 1.3302 | 0.2349 | | 2.5032 | 1.5434 | 0.1054 | |
| Kanto Dummy | 0.0337 | 0.0329 | 0.3066 | | -0.0080 | 0.0528 | 0.8795 | | 3.7530 | 1.7311 | 0.0306 | * | -0.4642 | 2.0253 | 0.8188 | |
| Chubu Dummy | 0.0153 | 0.0269 | 0.5700 | | 0.0662 | 0.0462 | 0.1523 | | -3.3185 | 1.4087 | 0.0189 | * | -0.2835 | 1.6495 | 0.8636 | |
| Kinki Dummy | 0.0250 | 0.0297 | 0.4004 | | 0.0946 | 0.0495 | 0.0566 | | -0.8374 | 1.5663 | 0.5931 | | -0.1175 | 1.8247 | 0.9487 | |
| Chugoku-Shikoku Dummy | -0.0002 | 0.0292 | 0.9949 | | -0.0365 | 0.0478 | 0.4447 | | -5.8032 | 1.8772 | 0.0021 | ** | -1.7498 | 1.7895 | 0.3286 | |
| Kyushu Dummy | -0.0216 | 0.0296 | 0.4653 | | -0.0627 | 0.0467 | 0.1802 | | -3.6000 | 1.5530 | 0.0208 | * | -2.6929 | 1.8104 | 0.1375 | |
| metropolice Dummy | 0.0992 | 0.0314 | 0.0017 | ** | 0.2514 | 0.0430 | 0.0000 | ** | 2.2695 | 1.6025 | 0.1573 | | 1.2461 | 1.9411 | 0.5212 | |
| constant | 7.9740 | 0.5769 | 0.0000 | ** | 0.0633 | 0.7308 | 0.9310 | | 38.5057 | 29.4695 | 0.1919 | | 449.90 | 29.5426 | 0.0000 | ** |

# 1) Test of cost shifting strategy

The amount of bad debt per hospital bed has a positive impact on the level of inpatient income per patient, that is, increasing of bad debt may encourage the hospitals to spend an effort to inflate the price of patient hospitalization. But the marginal effect of this impact is not so large. And, interestingly, we can observe this tendency stronger in metropolitan area than other area in Japan

# 2)test of public subsidies seeking

Public subsidization has not been influenced by the existence of bad debt in hospital. Instead, our finding that hospital where having ER setting may receive relatively less subsidies from government may mean that higher skilled medical services with higher medical price will positively work for inducing hospital financial efficiency.

# 3)test of cost cutting

bad debt does not give hospitals any motivation to keep going the cutting of personal expense. In other words, if we agree that cutting personal salary is one of the most effective means for hospital, they have no strong incentive to cut down the costs in response to the existence of bad debt.

# Discussion

In addition to three results above, we can estimate the possible tactics that hospital may take when facing the loss by bad debt

1) Is there a possibility that public hospital have less incentive to collect bad debt when they could subsidize from public account ?

2) Does private owned hospitals take their optional strategy of financial management, more strict cost cutting and cost shifting  due to cannot receive  public subsidies because of legal restriction?

3) Is there any possibility that hospital will change their strategy , As bad debt increase much more  in the future?

# Discussion(cont.)

Cost-effect of bad debt collection

It is relatively high cost for Japanese hospital to collect bad debt cost-effect due to legal restriction, So they may give up to collect and alternatively to choose cost shifting ,subsidization or another tactics to offset the loss by bad debt

# Limitation

* limitation to our analysis
  1 Just focus on the category of local public hospital
  2 During only one year period database (2012)

  our findings in this study are not applicable to all over Japanese hospital

# Further studies

* To achieve successful healthcare reform ,further discussion about hospital bad debt will be required in Japan

* Future research should focus on
  1 To ascertain how many bad debts occurred every year

  2 To analyze how the existence of bad debt affect physicians to provide medical treatment

  3 To analyze what moral hazard will happen when patients never pay their co-payment could receive care treatment

# Thank you for your attention