

# **Impacts of National Health Insurance and Recession on Medical Care Equity in Taiwan: Lessons from the Natural Experiment Study (1992-2002)**

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# outline

- Background
- Objectives
- Materials & Methods
- Results
- Conclusions

# Background

## Equity Dimensions

Equity in health care delivery

Equity in **Health Care Expenditure(HCE)**

Equity in health status

# Backgrounds:

Taiwan is a small island about 36,000 square kilometers and 22.5 million people.

The compulsory National Health Insurance (NHI) program has been implemented since 1995, covering about 96.2% of the total population in 2000

# Backgrounds: Research Questions

Health care delivery system and income are two factors that affect equity in medical care utilization.

This Research Question:

How deep is the impact of these two factors?

This study try to answer two questions

1.Does NHI program really eliminate the financial barrier? 健保減輕財務障礙?

2.If recession occurred, does it affect this goal?

經濟衰退是否影響健保目的?



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# Objective : Hypothesis

To examine the differences of the equity in HCE between the **NHI implemented in 1995** and **economic recession in 2001** in Taiwan. 健保1995,衰退2001

## Hypothesis 1:

Equity in HCE improves after having the **NHI program**.  
健保後，健康支出，公平性提高

## Hypothesis 2:

Equity in HCE and FB deteriorates with **recession**  
經濟衰退時,健康支出及財務負擔的公平性亦衰落

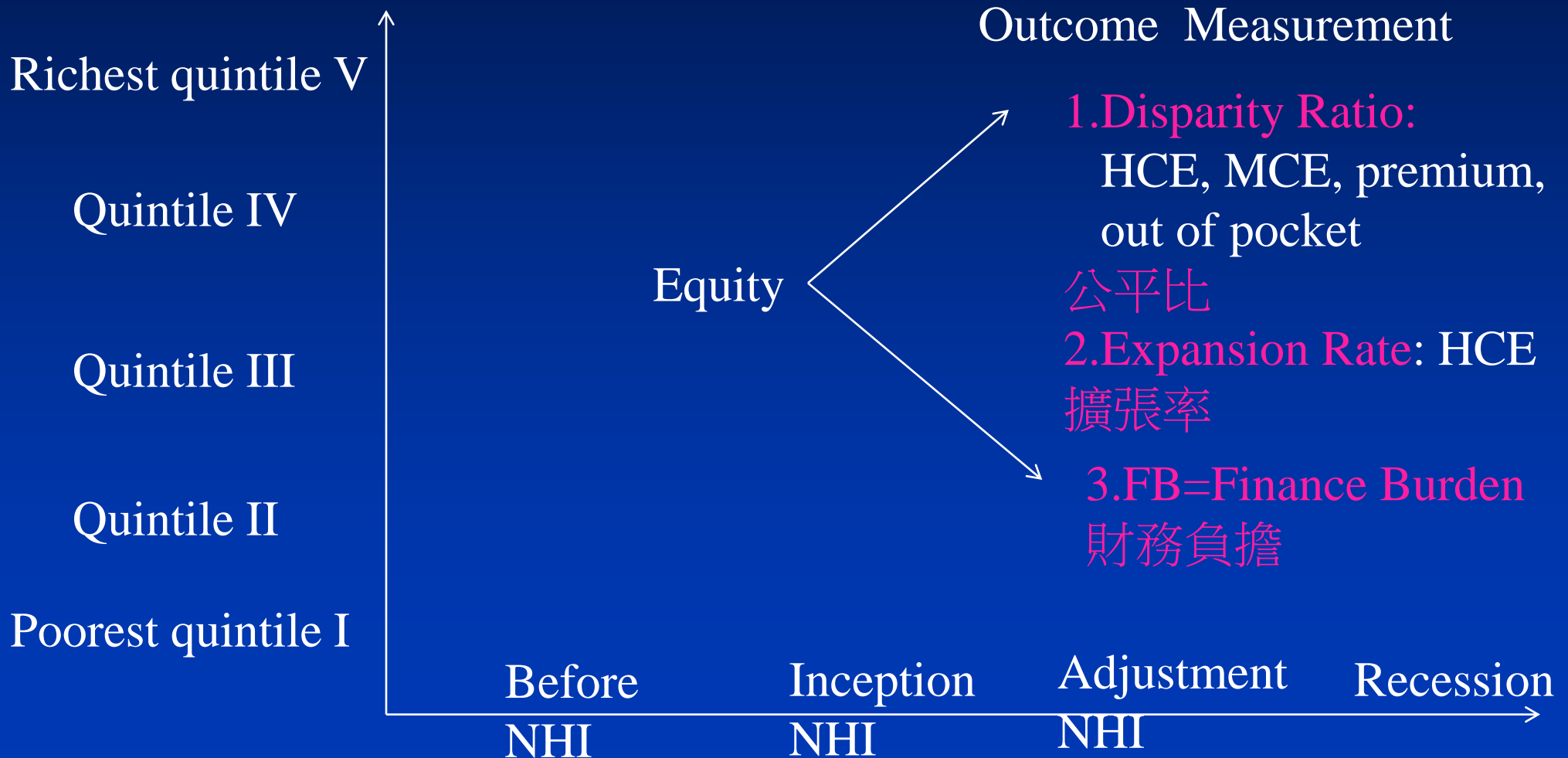
# Study Design

A survey follow-up study.

The study analyzes the equity in HCE for per capita and per family among 5 different income quintiles for 1992 to 2002



# Study Design





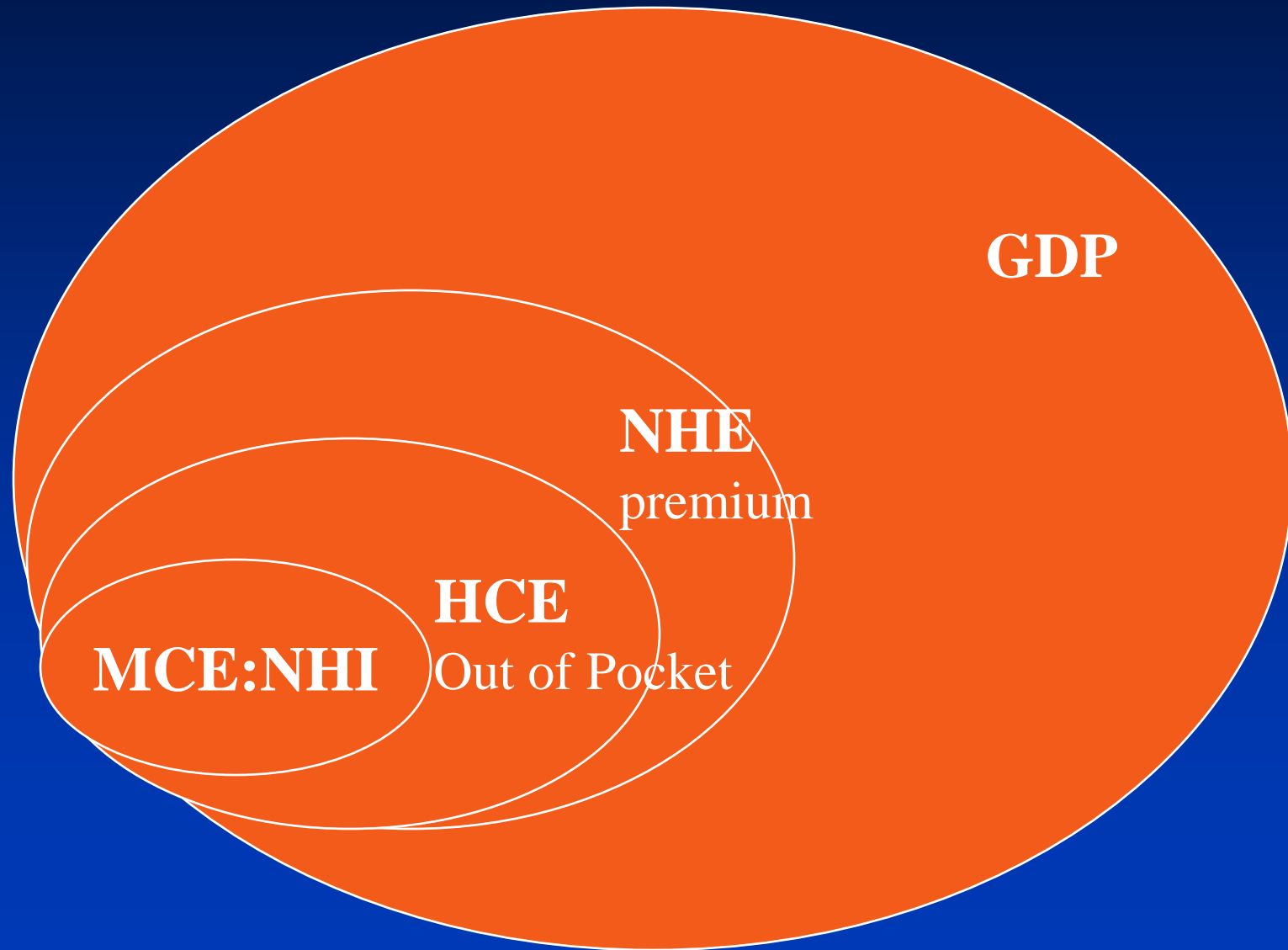
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# Methods: Definition

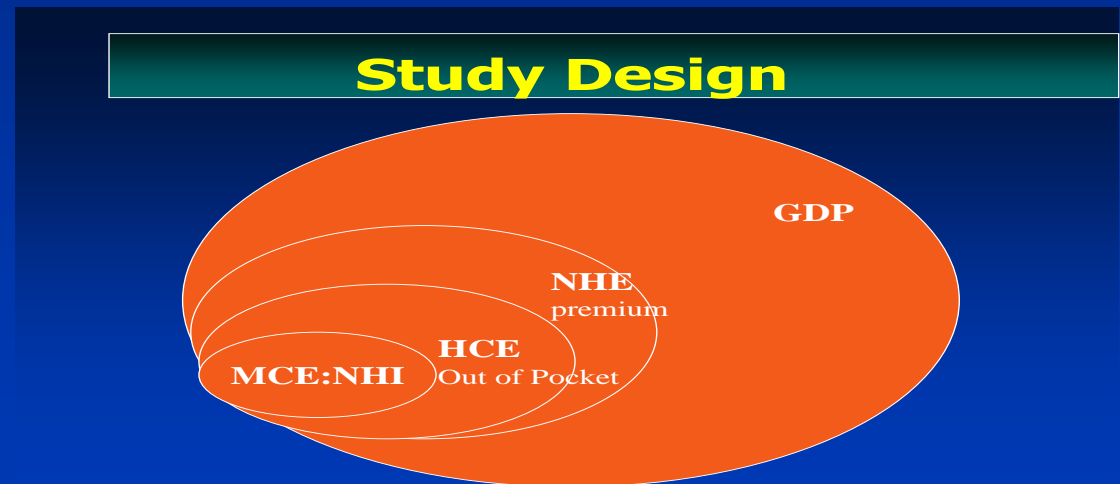
- 1. MCE:** Spend on Medical Care
- 2. HCE:** Spend on Health Care (MCE+out of pocket)
- 3. NHE:** Total Health Spending(HCE+premium)
- 4. Out of Pocket:** is not covered by NHI, copayment, long-term care, hospice, nursing home, prosthesis... etc.
- 5. Disposable Income=**consumption and saving

# Methods: Definition



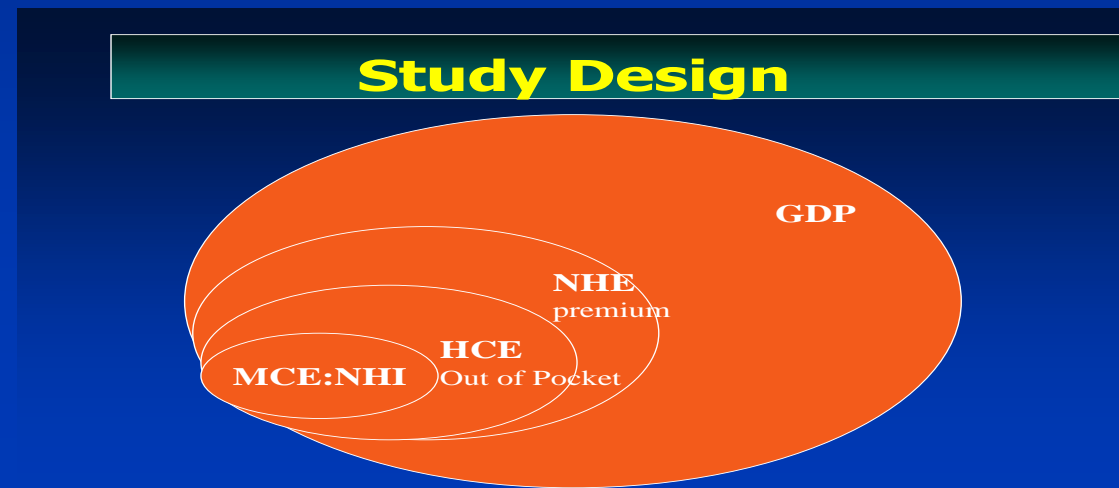
# Materials: 1st Data sources

## 1. Medical Care Expenditure (MCE) Data: From “Medical Claim Data Bank” from the Bureau of NHI(健保局)



# Materials: 2nd Data Sources

**2. Health Care Expenditure (HCE):**  
from The “survey of family income and the expenditure” data bank (out of pocket)  
from the Directorate-General of Budget Accounting and Statistics (主計處)

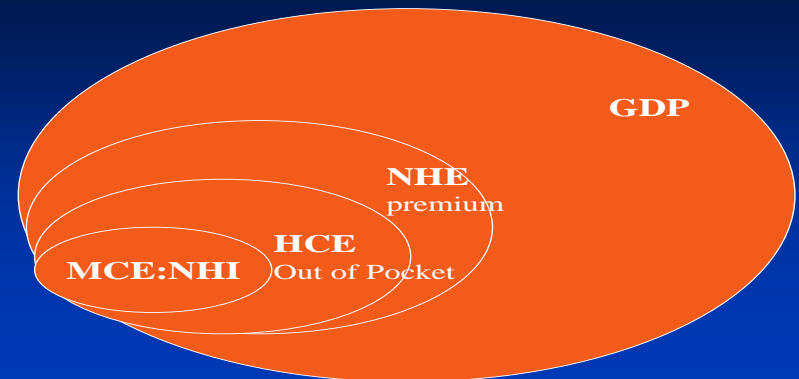


# Materials: 3rd data sources

**3. National Health Expenditure (NHE) data:  
from the “household registration”  
data bank**

**(premium ,administration) from the  
Ministry of Interior  
(内政部)**

## Study Design



# Methods: Definition 4 periods

1. **Before NHI Period: year 1992, survey data( 健保前)**
2. **Inception NHI Period: year 1995-1997(健保)**
3. **Adjustment NHI Period: year 1998-2000(修正期)**
4. **Recession Period: Year 2001-2002,(衰退期)  
2001 negative economic growth rate**



# Methods: 4 Outcome Measurement

**Contribution of NHI** =  $\frac{HCE}{\text{premium} + \text{out of pocket}}$  by individual,

To prove Hypothesis 1.

**Disparity Ratio** =  $\frac{\text{richest}}{\text{poorest}}$  by family HCE, per capita HCE, MCE, premium and out-of-pocket spending

To prove Hypothesis 1 and Hypothesis 2

# Methods: 4 Outcome Measurement

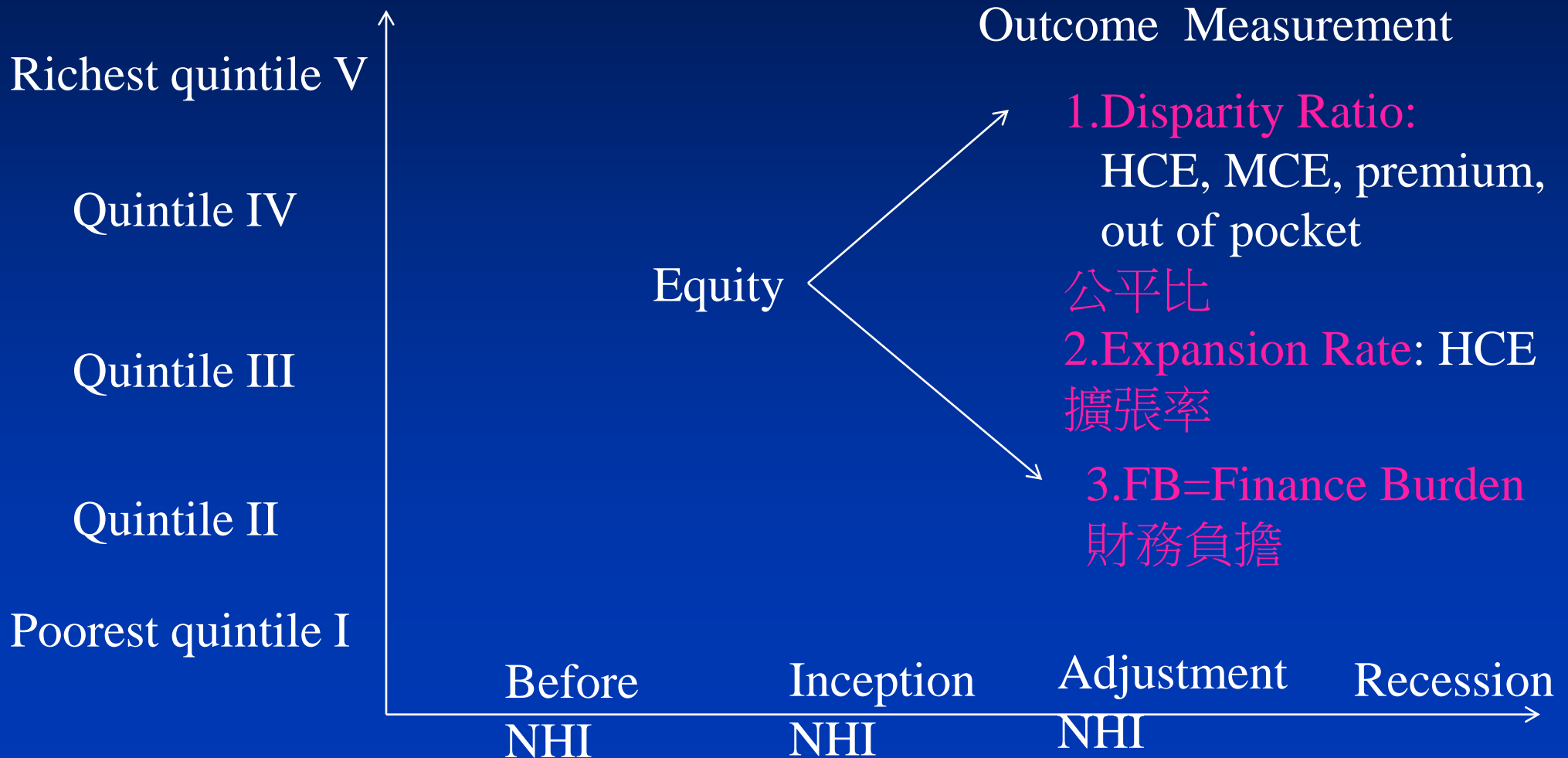
**Finance Burden (FB)** =  $\sum \frac{\text{premiums} + \text{out of pocket}}{\text{disposable income}}$  by  
quintiles

To prove Hypothesis 2.

**HCE Expansion Rate** =  $\frac{\text{per capita HCE of different periods}}{\text{per capita HCE in inception NHI period}}$

To prove Hypothesis 2.

# Study Design

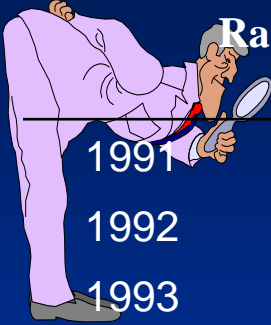




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# The impact of NHI and recession in total expenditure and HCE



Year	Economic Growth Rate	% of NHE/GDP	Out-of-pocket payment of all HCE %	Health Care Expenditure Growth Rate			
				Insurance sector	Family out-of-pocket	Final Expenditure	
1991	7.6	4.67	55.08				
1992	7.5	4.77	50.72	13.19	24.19	4.22	8.00
1993	7.0	4.88	51.08	14.13	13.29	14.94	16.40
1994	7.1	4.93	49.29	12.11	16.21	8.17	6.73
<b>1995</b>	<b>6.4</b>	<b>5.27</b>	<b>35.73</b>	<b>18.04</b>	<b>49.60</b>	<b>-14.44</b>	<b>9.77</b>
1996	6.1	5.29	33.33	11.78	15.96	4.28	12.96
1997	6.7	5.27	34.67	11.21	8.96	15.70	13.51
1998	4.6	5.33	33.43	9.50	11.58	5.59	5.84
1999	5.4	5.46	33.99	7.71	6.81	9.50	7.90
2000	5.9	5.44	36.57	3.99	-0.07	11.89	10.53
<b>2001</b>	<b>-2.2</b>	<b>5.77</b>	<b>35.52</b>	<b>3.83</b>	<b>5.55</b>	<b>0.85</b>	<b>0.14</b>

The economic growth rate and HCE in Taiwan

# Disparity Ratio = $\frac{\text{richest}}{\text{poorest}}$ by family income

Health Care Expenditure US\$						Average	
	I Poorest	II	III	IV	V Richest	Average	
HCE	<b>569.20</b>	458.00	447.90	452.30	463.90	<b>478.30</b>	
Family Income 5 Quintile							
Year	I Poorest	II	III	IV	V Richest	Ratio of V/I	
1992	7.37	13.24	17.52	23.21	38.66	<b>5.25</b>	<p style="text-align: center;">Become worse</p> 
1995-1997	7.25	12.96	17.45	23.34	39.01	<b>5.38</b>	
1998-2000	7.11	12.86	17.50	23.29	39.24	<b>5.52</b>	
2001-2002	6.55	12.19	17.01	23.14	41.10	<b>6.27</b>	

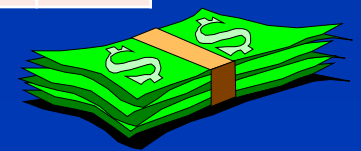
**Disparity Ratio** =  $\frac{\textit{richest}}{\textit{poorest}}$  by family HCE

Family Health Care Expenditure

Year	I Poorest	II	III	IV	V Richest	Ratio of V/I
1992	13.32	17.28	18.81	22.39	28.19	2.12
1995-1997	14.83	18.21	20.38	22.07	24.50	1.65
1998-2000	13.69	17.92	20.43	22.75	25.21	1.84
2001-2002	13.22	17.48	20.34	22.93	26.02	1.97

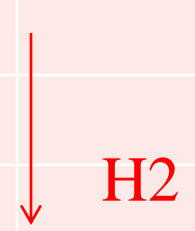
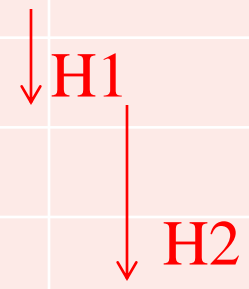
H1

H2



# Disparity Ratio = $\frac{\text{richest}}{\text{poorest}}$ by per capita HCE & MCE

Per Capita Health Care Expenditure						
Year	I Poorest	II	III	IV	V Richest	Ratio of V/I
1992	20.86	17.98	17.90	20.14	23.13	1.11
1995-1997	23.24	18.77	18.59	19.16	20.24	0.87
1998-2000	24.44	19.25	18.61	18.90	18.81	0.77
2001-2002	22.28	19.00	18.86	19.29	20.57	0.92
Per Capita Medical Care Expenditure						
Year	I Poorest	II	III	IV	V Richest	Ratio of V/I
1995-1997	24.11	19.20	18.89	18.89	18.90	0.78
1998-2000	25.72	19.77	18.90	18.65	16.95	0.66
2001-2002	23.39	19.61	19.12	19.06	18.82	0.80





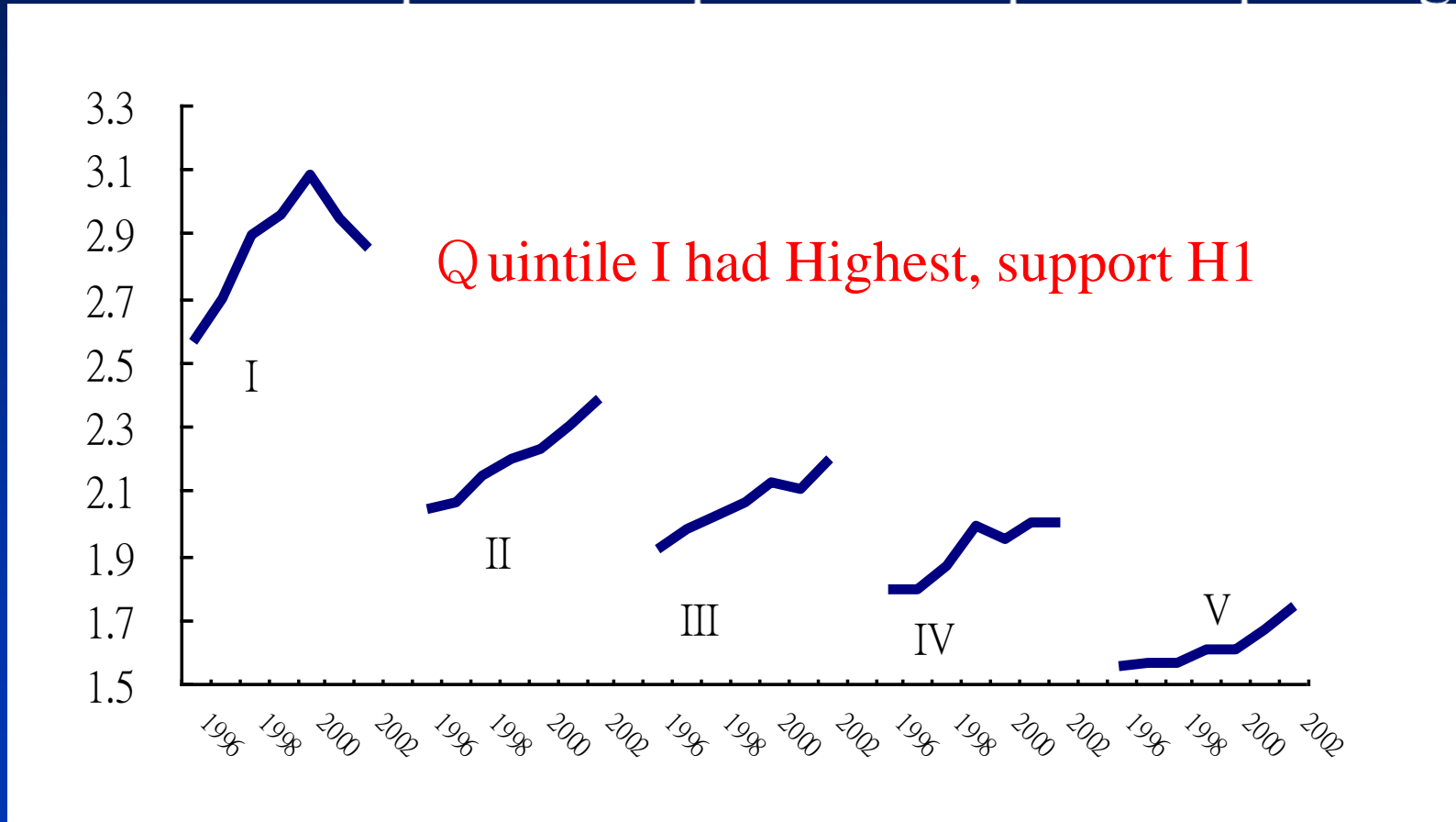
# Disparity Ratio = $\frac{\text{richest}}{\text{poorest}}$ by Per Capita Out-Of- Pocket, Per Capita Premium

Per Capita Out-Of-Pocket						
Year	I Poorest	II	III	IV	V Richest	Ratio of V/I
1995-1997	20.52	17.41	17.65	20.00	24.43	1.19
1998-2000	19.52	17.21	17.47	19.84	25.96	1.33
2001-2002	18.13	16.72	17.90	20.12	27.13	1.50
<div style="text-align: right; color: red; font-weight: bold;">H2</div>						
Per Capita Premium						
Year	I Poorest	II	III	IV	V Richest	Ratio of V/I
1995-1997	16.41	19.06	20.08	20.67	23.78	1.45
1998-2000	15.54	19.46	20.03	21.06	23.90	1.54
2001-2002	15.35	18.24	19.79	21.46	25.15	1.64
<div style="text-align: right; color: red; font-weight: bold;">H2</div>						

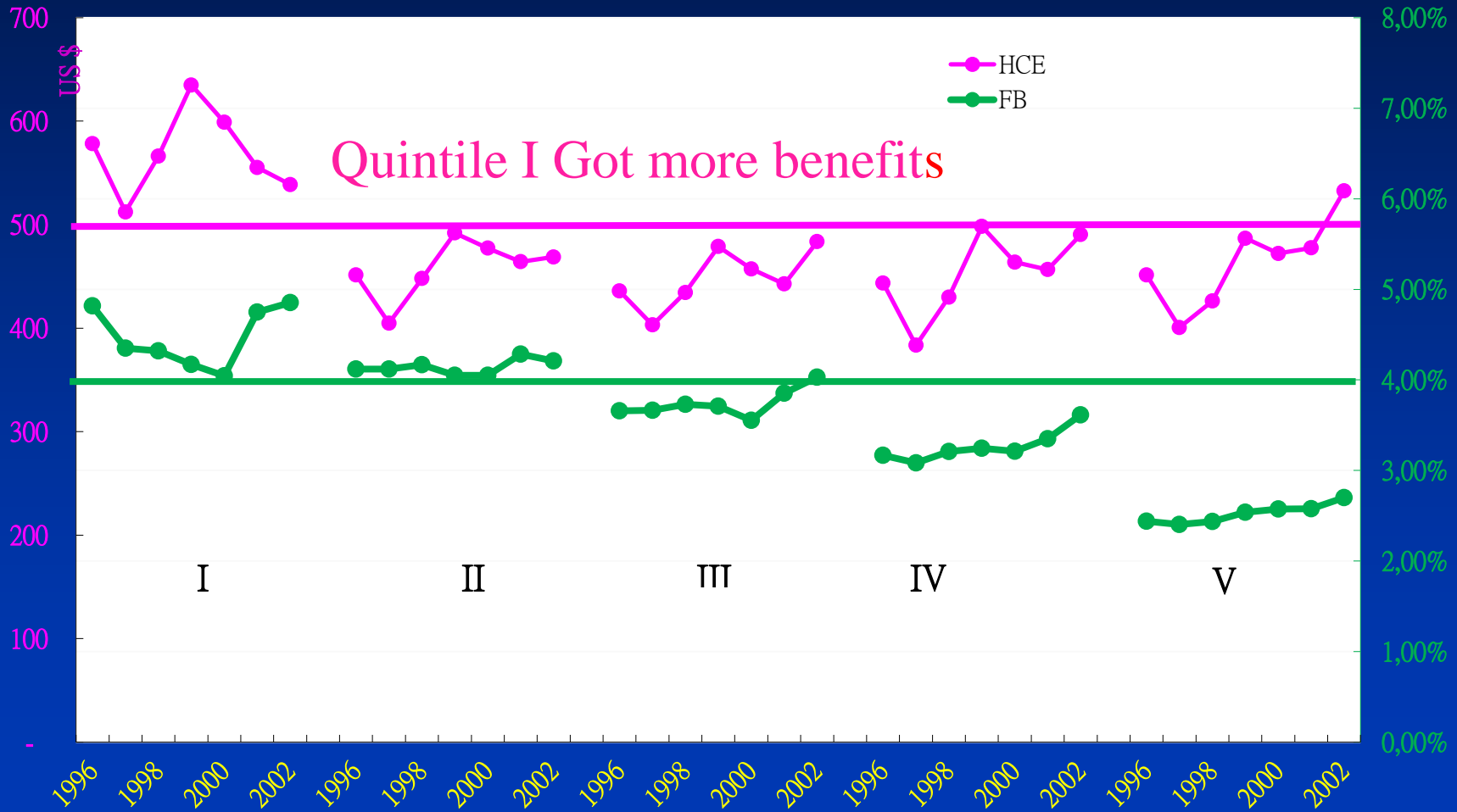


Contribution of NHI =  $\frac{HCE}{\text{premium} + \text{out of pocket}}$  by individual

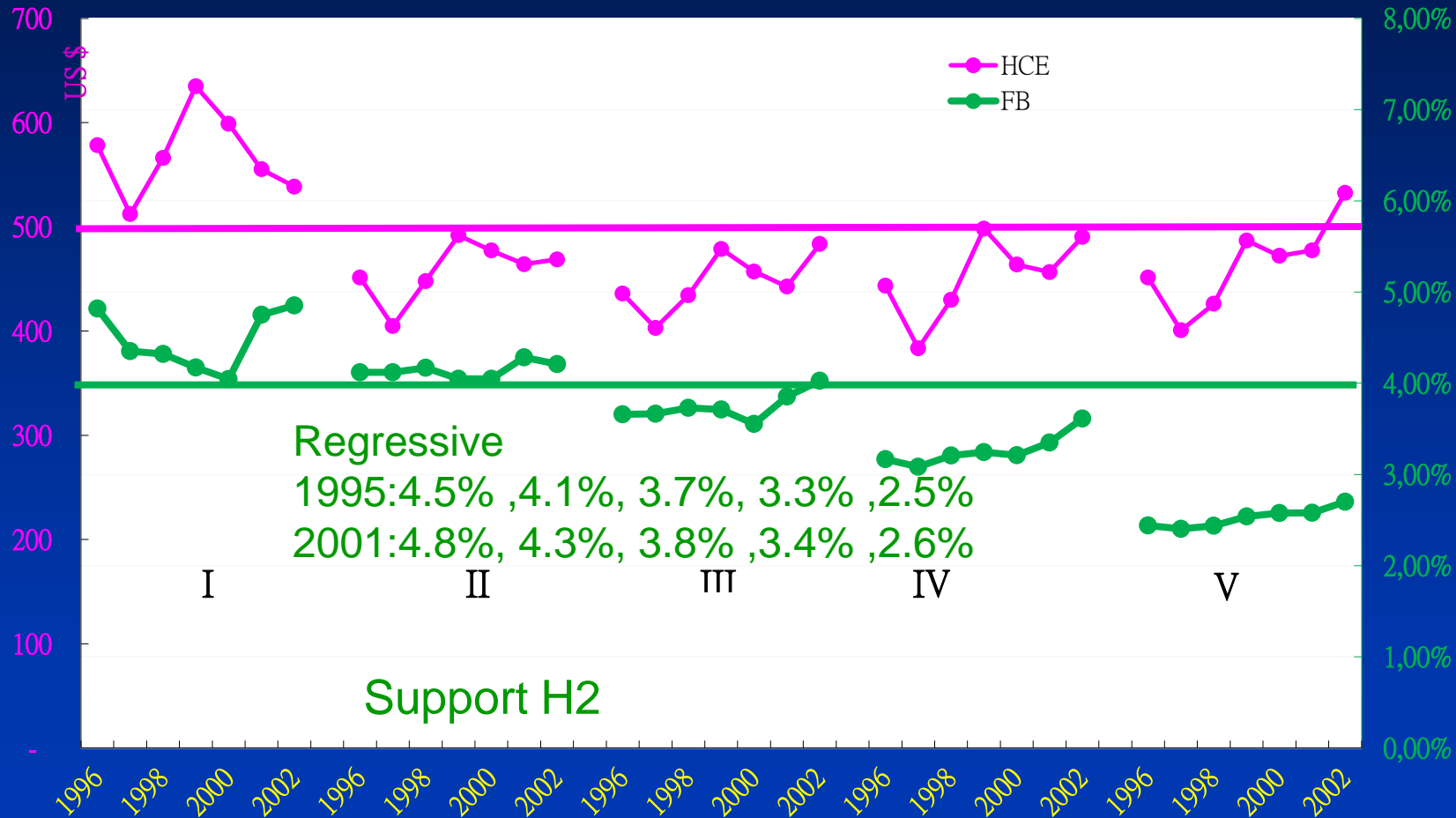
Ratio of HCE to premiums plus out-of-pocket spending



# HCE among Different Quintiles from 1996 to 2002



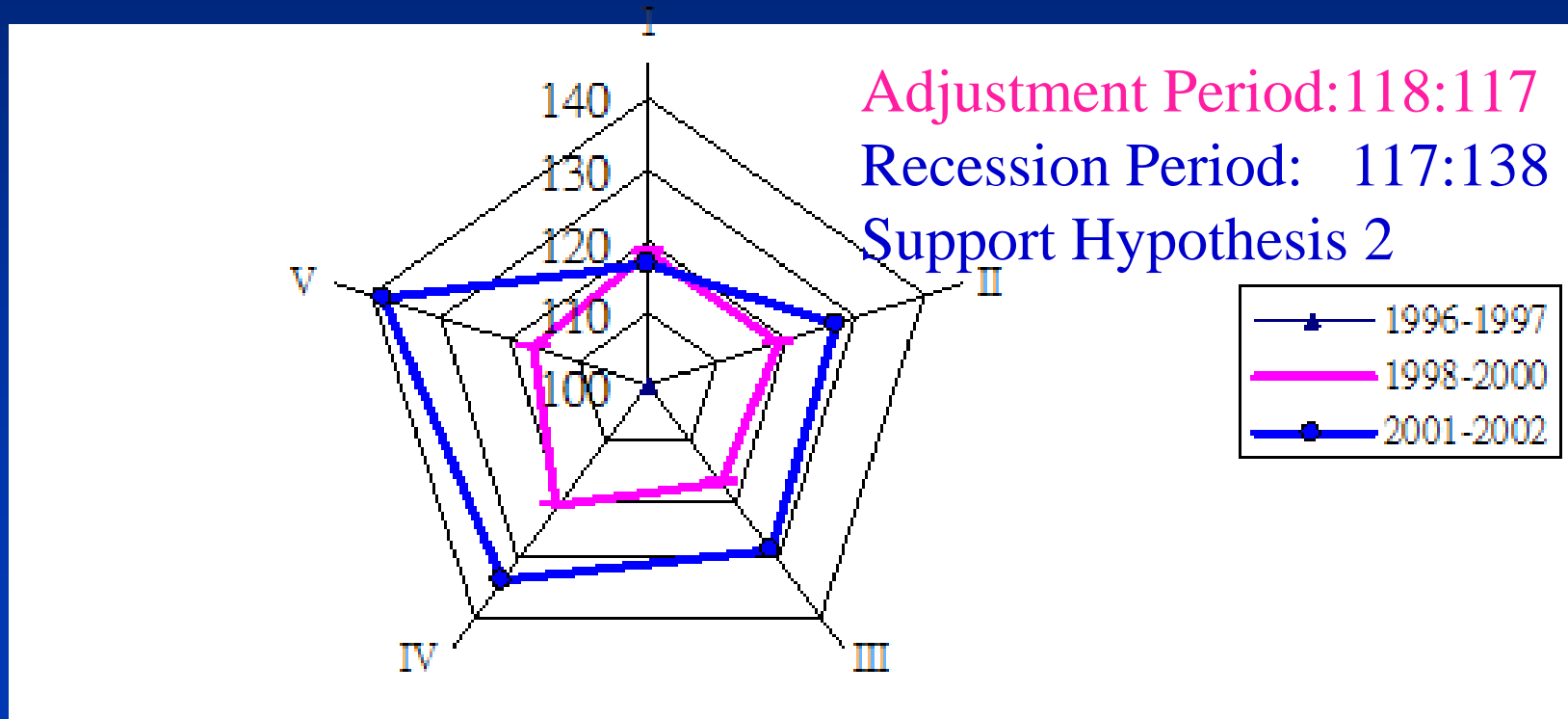
**Finance Burden (FB) =  $\sum \frac{\text{premiums} + \text{out of pocket}}{\text{disposable income}}$**   
**among different quintiles from 1996 to 2002**



## HCE Expansion Rate

$$= \frac{\text{per capita HCE of different periods}}{\text{per capita HCE in inception NHI period}}$$

This Expansion Rate can show the horizontal equity among the same quintiles during the different periods.



# The Impact of NHI and Recession on Equity in Health Care Expenditure

This study confirms the two hypotheses

Before and after NHI was implemented, the ratio of HCE between the richest and the poorest was 2.12 and 1.65 respectively.

The inequity in HCE was expanded when recession happened.

The per capita expansion rate of inequity in HCE was significant while the severity of recession worsened in 1998 and 2001(118:117 and 117:138).

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# CONCLUSIONS

**This study confirms the two hypotheses**

**Firstly, the health care reform is still an unfinished job: The redistribution of HCE has improved the equity in HCE but the inequity in HCE still exists in spite of the NHI intervention.**

**Secondly, the resource allocation needs to be rearranged whenever recession occurs, recession expedites the inequity in HCE although the NHI program is implemented.**

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Thanks ! ! Thanks ! !

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