Experimental Economics in Indonesia: Lesson Learned and Best Practices

by

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Introduction

Experimental economics is the application of experimental methods to study economic questions.

Experiments are **used**:

1) to test the validity of existing economic theories
2) to develop economic theories
3) to examine a policy (before being implemented)
4) in the **teaching of economics**

Using cash-motivated subjects, economic experiments create real-world incentives to help us better understand why markets or other exchange systems work the way they do. → **induced value theory**

Experiments may be **conducted in laboratory settings or in the field**.

Introduction

- **Obstacle** of development of *experimental economics* is that many economists are brainwashed to the effect that economics is a non-experimental subject, and that it is impossible to control the generation of economic data in the same way as the experimental hard sciences control the generation of data.

Introduction

- This presentation is to demonstrate that this is not true: that is indeed possible to generate economic data under controlled conditions, and that by so doing economists are better able to understand existing theories and develop new ones.
- Experimental methods in economics are an excellent way of generating data of a better quality (and possibly of a lower cost) than the data are currently available (from survey or secondary data) for causal-effect relationship. At the very least, experimental methods provide an alternative way of obtaining data required to solve many research problems in economics.

Why Using Experimental Economics?

- In recent two decades, scientists are increasingly aware that economics & psychology are very closely related each other.
- Human behaviours are more complex than those provided in ”traditional” economic theory.

→ Economists are increasingly using aspects of psychology or behaviour to test & improve economic theory by experimental methods.

Why Using Experimental Economics?

- Highly interests in experimental methods were depicted when Vernon Smith (*experimental economist*) & Daniel Kanhneman (*bevavioral economist*) were given Nobel Prize in 2002, and *the Royal Swedish Academy of Science gave statement that* :

"Today behavioral economics & experimental economics are among the most active fields in economics, as measured by publications in major journals, new doctoral dissertations, seminars, workshops, and conferences."

- Relating to rationalities of economic agents in the interpretation of experimental results, Vernon Smith (2005) gave expression that:

  "My point is simple: when experimental results are contrary to standard concepts of rationality, assume not just people are irrational, but that you may not have the right model of rational behavior."

→Economists suggest that topics of *behavioral economics & experimental economics* should be included in every microeconomic textbook for undergraduate students to make them easy to understand economic theory

- Existing microeconomic textbooks mainly focus on basic problems and theory.
- Empirical Evidence: **students can understand an economic theory much better if lecturers use experimental design (by simulation) when they explain a theory** (Taylor 2007; Dickie 2006)

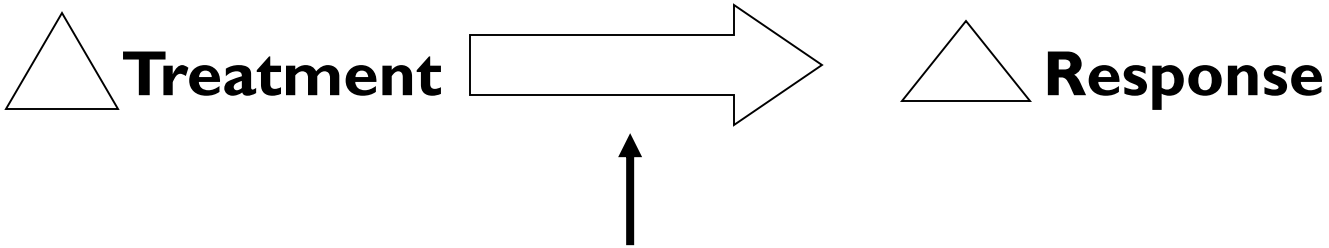
→Ignoring these facts or economic agent behaviour can alleviate students' motivation so that this disrupts in **students learning process**. They feel that there is too big difference between economic theory in the class and behaviour in the reality.

3 Basic Principles in Experimental Design

(1) **Repitition (n)** to estimate error, and reduce standard deviation of treatments mean

(2) '**Randomization**' to obtain unbiased estimates

(3) **Environmental Control**: to reduce experimental error so that we confidently conclude that response differences are due to treatment differences



Environmental Control

(other factors are made the same, ceteris paribus)

Characteristics of Data Collecting by Experimental Design

- Many eonomists are convinced that economic theory **can not be tested by experimental method** in laboratory settings because they consider that the characteristics of economic agents are various a lot & **very hard to control** so that it is difficult to conclude the cause-effect relationship because of *confounding variables*.

- Economist, however, agree that every economic agent **behaves rationally**, in the sense that their decisions always consider "benefit and cost" of their actions, and are **based on incentive structure** of each activities.

Induced-Value Theory (Smith, 1976):

- Proper use of a reward medium allows an experimenter to *induce* prespecified characteristics in experimental subjects, and the subjects' innate characteristics become largely irrelevant (not influence any more).

- If basic characteristics of economic agents (*experimental subjects*) are the same or homogenous, then researcher can do experiment because the basic principles of environmental control have been done.

3 Sufficient Conditions of IVT (Control Principles)

1. ***Monotonicity***. Subjects must prefer more reward medium to less, and not become satiated.
2. ***Salience.*** The reward received by the subject depends on her actions (and those of other agents) as defined by institutional rules that she **understand**.
3. ***Dominance***. Changes in subjects' utility from the experiment come predominantly from the reward medium, and other influences are negligible.

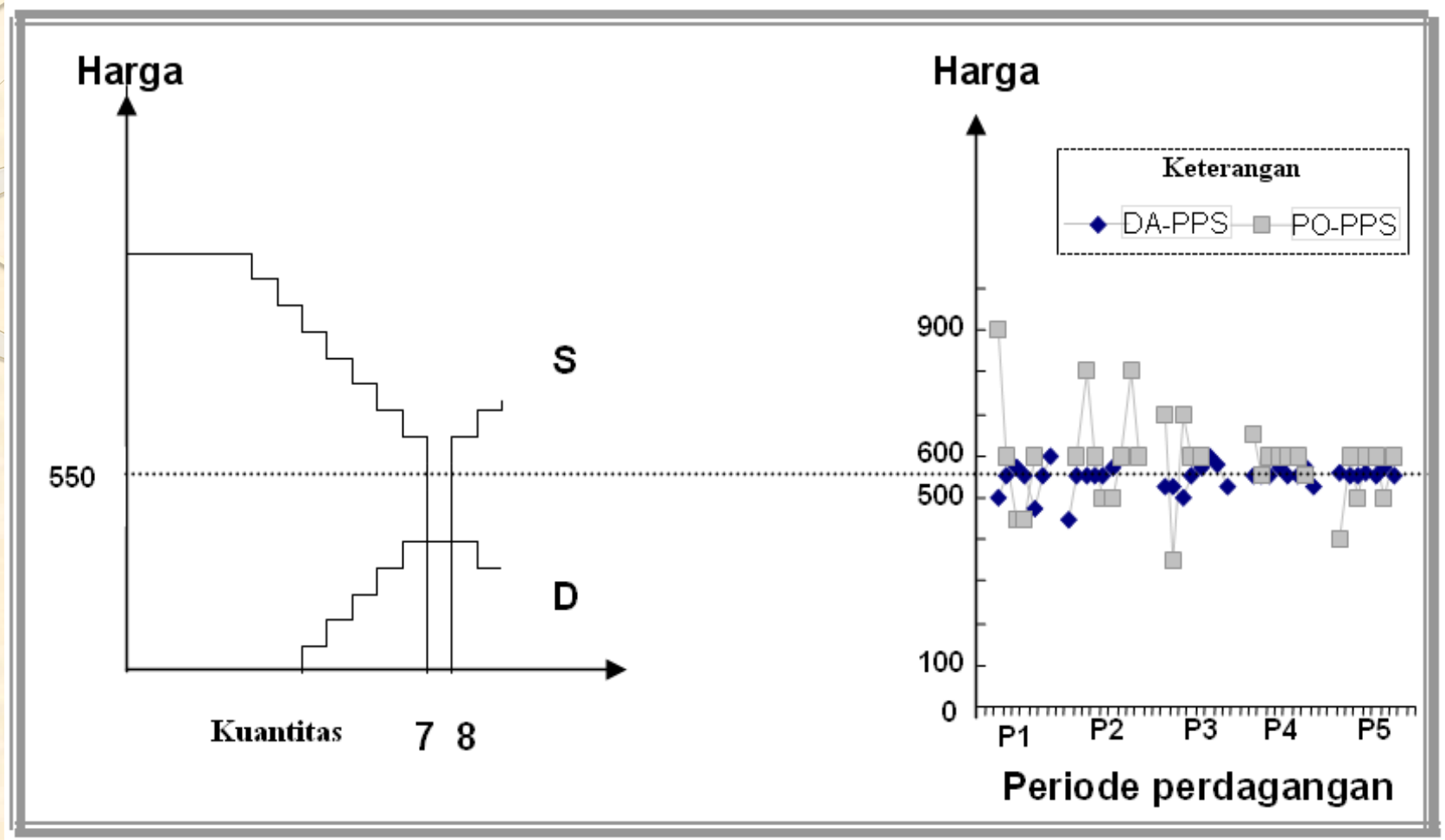
When the 3 conditions are satisfied, the experimenter achieves control over agents'characteristics

Experimental Economics in Indonesia (my publications)

1. An Economic Experiment to Investigate the Performance of Syariah and Conventional Banks. September 2004. Forum Statistika dan Komputasi (Special edition of national Workshop), Departemen Statistika IPB.
2. Investigation on Sellers' Behaviour in Price Conspiraciy. June 2004. Jurnal Ekonomi Vol 15, Universitas Borobudur.
3. An Economic Experiment to Investigate Conspiracies among Sellers, and Private Discounts at a Posted Offer Transaction System. 2003. Presented in National Seminar on Statistics & Mathematics, Surabaya.
4. Economic Experiment to Investigate the effect of Information and the number of seller and buyer in market transaction. November 2000. Jurnal Ekonomi Vol 7, III, Universitas Borobudur.
5. Experimental Economics and Rational Expectation. August 1997. Buletin Ekonomi Vol I, No 1, FE-UKI.

Experimental Economics in Indonesia (my other researches not yet published)

1. Economic Experiment to Investigate the Obedience of Tax Payer in the Self-Assesment System.
2. Economic Experiment to Investigate the Effect of Variation of Price Changes on Expected Inflation and the Optimization of Consumption Choices
3. Economic Experiment to Investigate Pros and Cons of a Policy implemented to a Bank with problems.
4. Economic Experiment to Investigate a Strategy to Increase the Efficiency of Irigation Water by SRI (System of Rice Intensification) Method



Graph of Theoritical Supply & Demand (left side); Development of *Contract Price* for Posted Offer **PO-'PPS'** and Double Auction **DA-'PPS'** Transactions with 5 Seller and 5 Buyer for 5 Rounds of Experiment (right side)

Tabel 1. Some Responses of the Effect of 6 Combination of Market Transaction Systems

	5 Sellers-5 Buyers ('PPS')			1 Sellers-5 Buyers (Monopoly)		
	DT	DA	PO	DT	DA	PO
HKT	Rp.550	**Rp.550**	Rp.550	Rp.550	Rp.550	Rp.550
P_e	Rp.477	**Rp.549**	Rp.590	Rp.477	Rp.672	Rp.620
Q	5-7 buah	**7-8 buah**	5-8 buah	7-8 buah	6-7 buah	2-8 buah
EF	88.6 %	**98.9 %**	82.6 %	93.2 %	95.2 %	87.4 %
BS	63.2 %	**50.6 %**	44.9 %	70.6 %	27.3 %	39.3 %
SS	36.8 %	**49.4 %**	55.1 %	29.4 %	72.7%	60.8 %
CV	24.8 %	**5.5 %**	17.8 %	23.4 %	7.4 %	14.1%

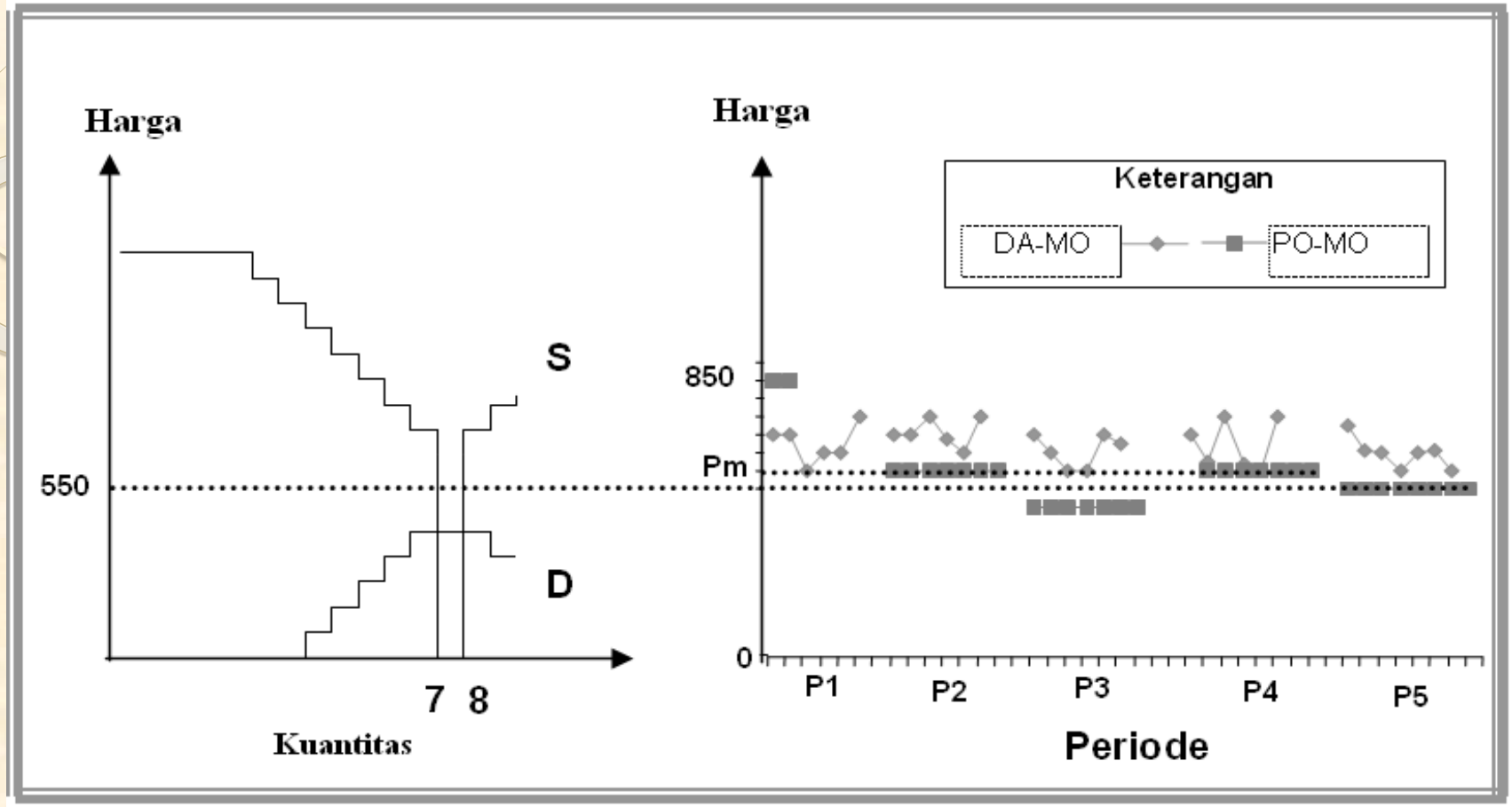
Note:

HKT = Theoritical Equlibrium Price; Q = Interval of Quantity

$\overline{P_e}$ = Empirical Equlibrium Price (average of *contract price*);

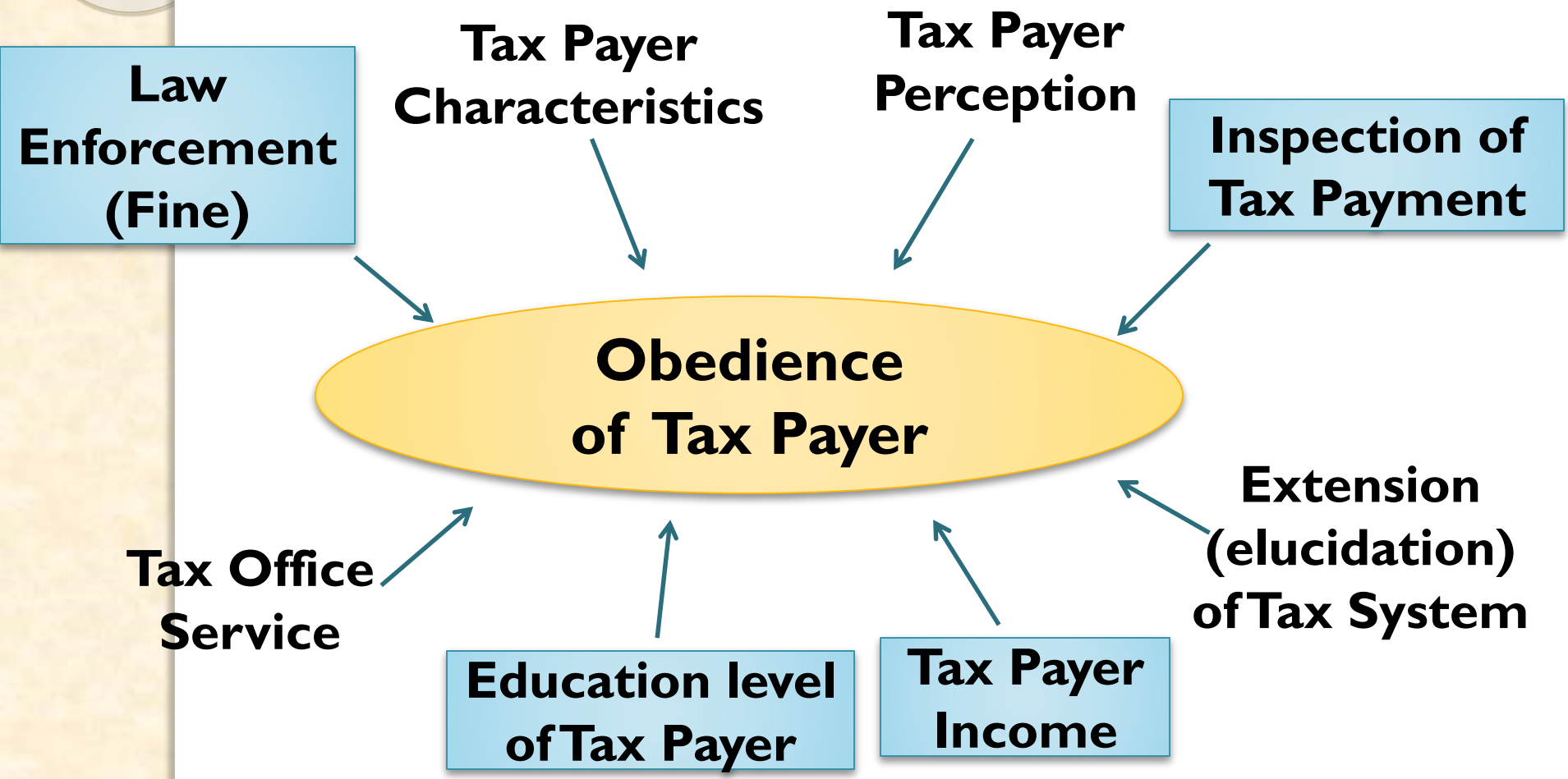
EF = average of Efficiency; CV = Coefficient of Variation

BS = Average of Buyers' Surplus; SS = Average of Seller Surplus



Graph of Theoritical Supply & Demand (left side); Development of *Contract Price* for Posted Offer **PO-'MO'** and Double Auction **DA-'MO'** Transactions with 1 Seller and 5 Buyers for 5 Rounds of Experiment (right side)

Investigation of Influential Factors on the Tax Payer Obedience



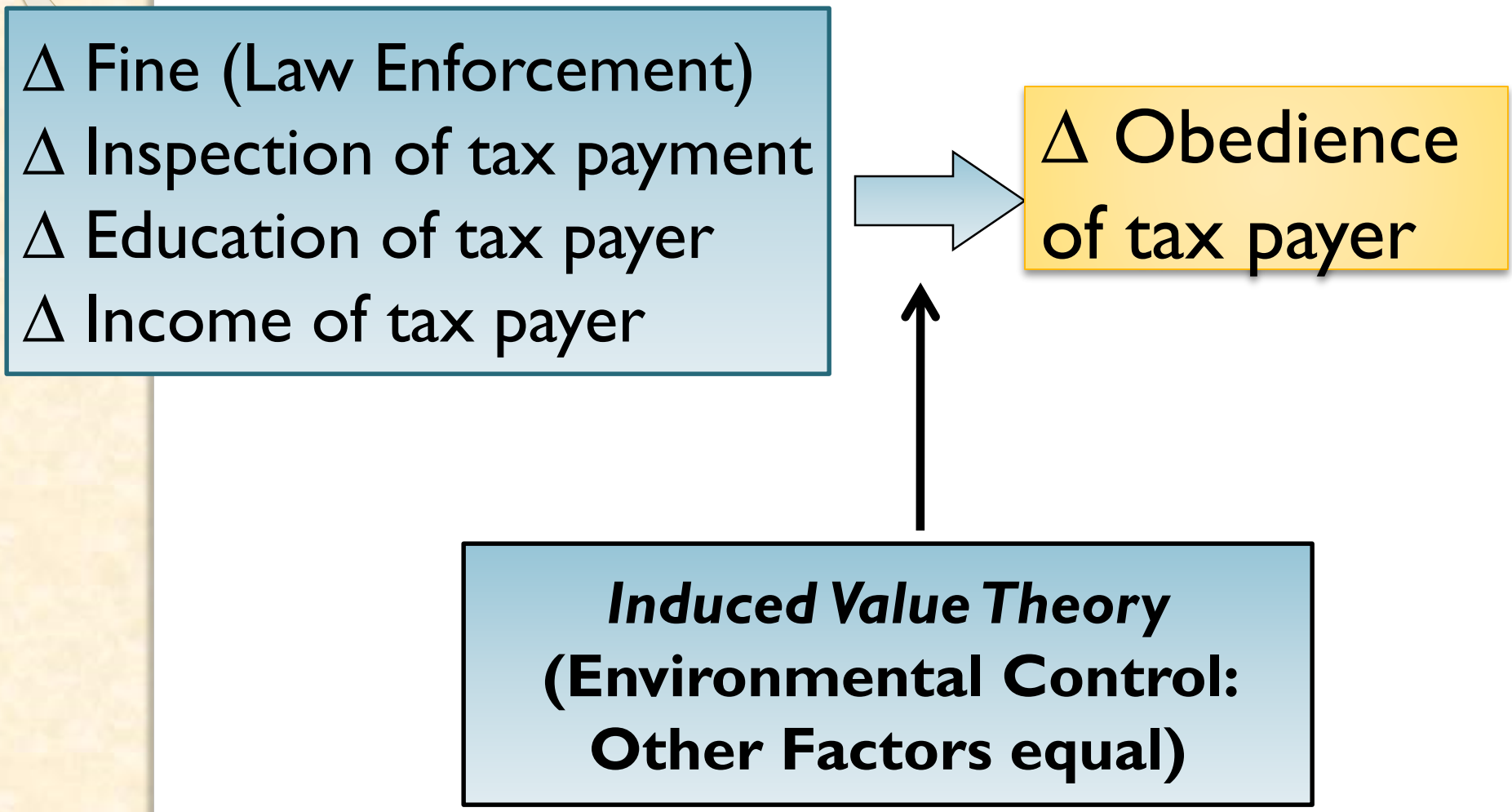
Data Structure of Survey Method

Respondent (the-i tax payer)	Obedience (Y)	Lack of Pay-ment	Fine (X_{1i})	Inspec tion (X_{2i})	Education (X_{3i})	Income (X_{3i})	…. (X_{ji})
1							
2							
3							
4							
5							
:							
n							

?

Is it possible to ask Respondent if he pay his income tax truly or honestly? How obedient does he pay his tax?

Investigation Principle by Using Experimental Method



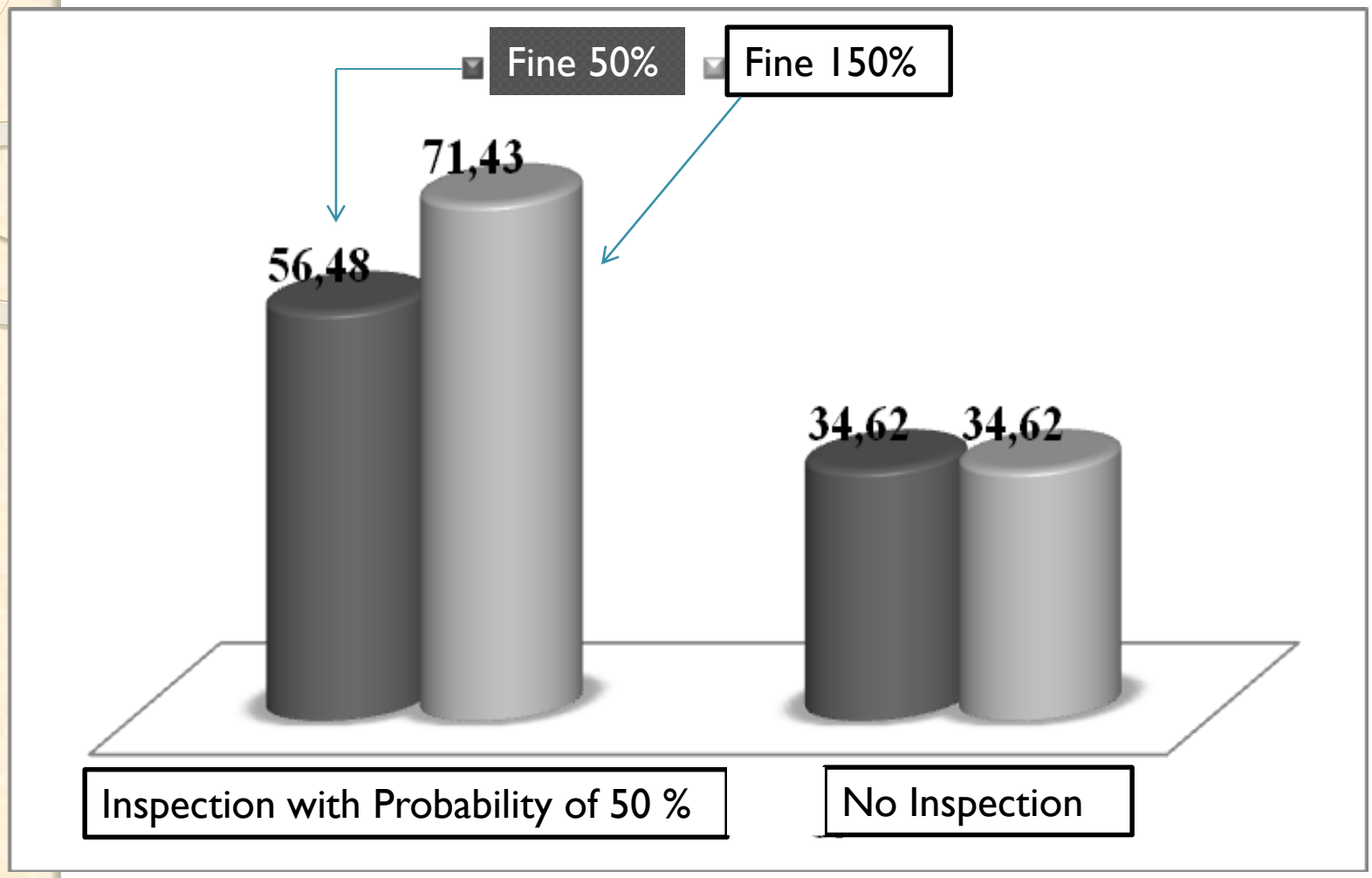


Figure 1. Estimated Obedience Level of Tax Payer (%) by Inspection Probability and Fine

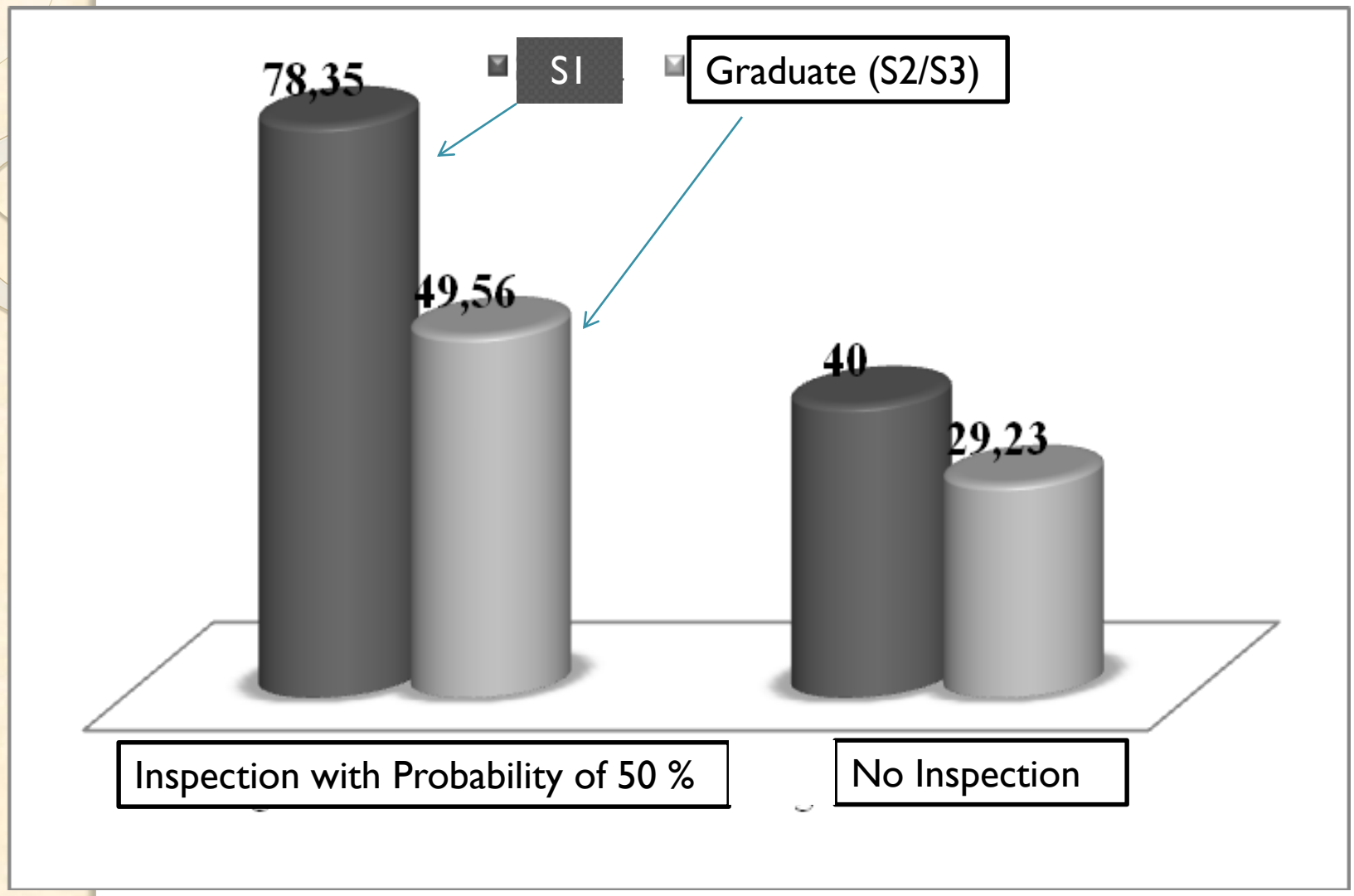


Figure 2. Estimated Obedience Level of Tax Payer (%) by Inspection Probability and Education of Tax Payer

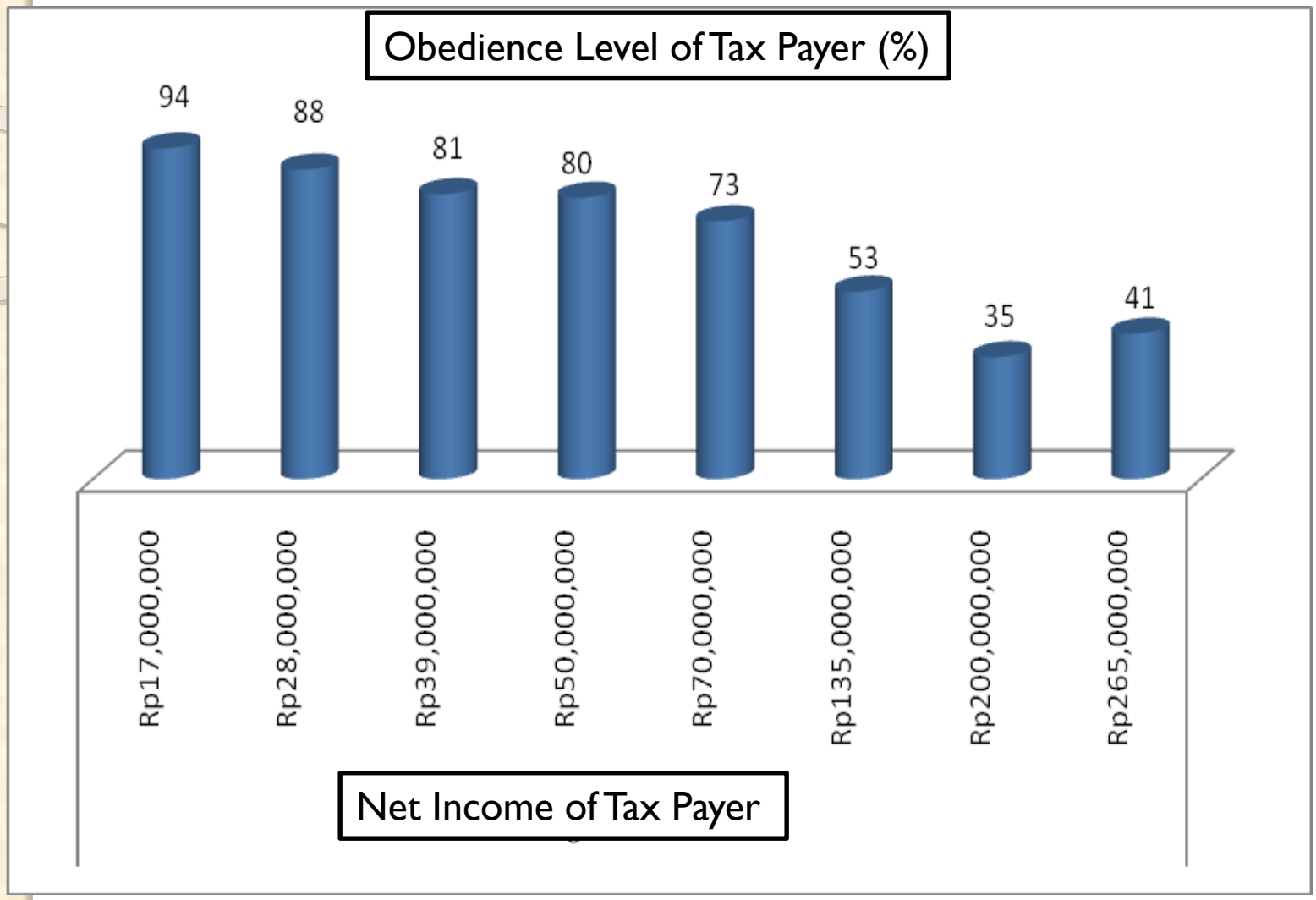
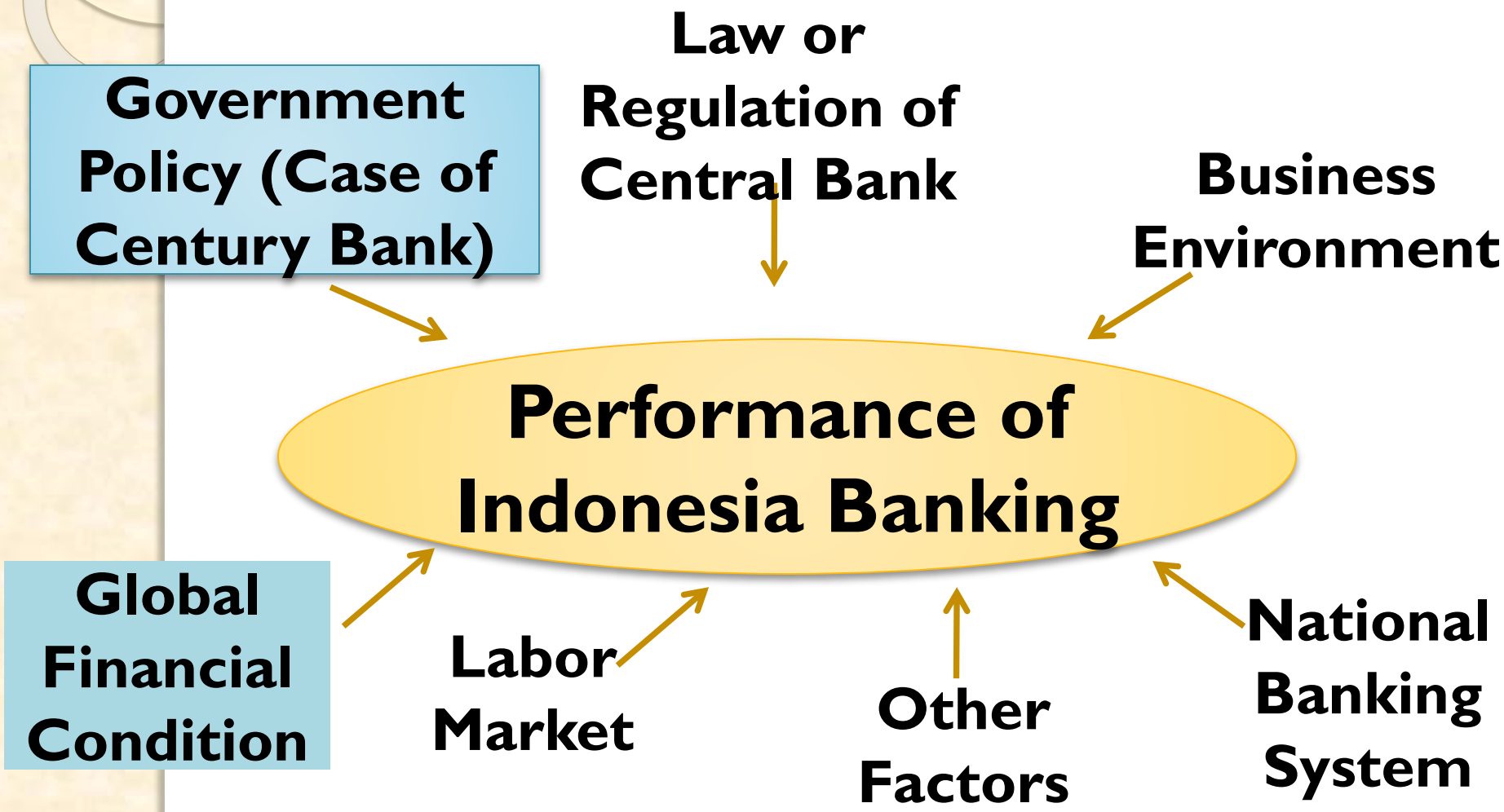


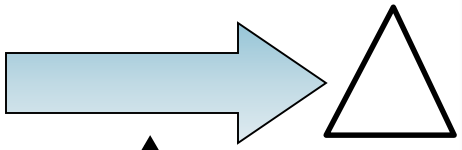
Figure 3. Estimated Obedience Level of Tax Payer (%) by Tax Payer Income

Investigation of Influential Factors on the Performance of Indonesia Banking



Investigation Principle by Using Experimental Method

1. Policy Option:
   i. Financial Assistance (Bail Out) for Century Bank
   ii. Clossing Century Bank
2. Global Financial Condition
   i. Crisis
   ii. No crisis



Performance of Indonesia Banking

Induced Value Theory
(Environmental Control: Other Factors equal)

Design of an Experimental Economy

4 healthy banks & 1 bank with a problem

Depositing Money

Deposit Interest

Making a Loan

Credit Interest

Employing labor force *or*
Laying off Workers

output

5 Firms (Investors)

Depositors & as Workers at Firms

An Experiment
Conducted in a Laboratory Setting

Most experimental studies to date have used undergraduate & graduate students as subjects for reasons of:

- ready access to the subject pool
- Convenience in recruiting on university campuses where most of the research is carried out
- Low *opportunity cost* of student subjects
- Relatively steep learning curve
- Some lack of exposure to confounding external information

The use of real economic agents (professionals) may solve some problems but creat others