

Why innovation policy does not work in Thailand? An economic experiment on product imitation in the Thai society using behavioral game theory

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ABSTRACT

This study constructs an economic experiment using behavioral game theory to investigate factors influencing decisions to imitate industrial products. Players are divided into 2 firms. A firm launches a new product then another firm decides whether to imitate the product as well as to set a new price for the product. The price war continues until a firm sets a final price. After experiencing the whole process, the last firm will make a final decision whether to launch a new product again or not. Findings show that imitation significantly threatens firms in order to launch new products to market. A firm which is able to set the final price tends to imitate. The presence of uncertainty regarding to social pressure from buyers who may refuse to buy imitative products does not play significant role in stopping imitation. The study concludes that imitation naturally takes place in the Thai society without fears of being sanctioned by the society. Therefore, Thailand may not expect its economic prosperity through new product development.

Keywords: Product imitation, price war, social sanction, behavioral game theory, experimental economics

JEL Classification: C91, C71, C54

1. Introduction

Experimental economics is new to economists. Although the discipline was originated by Reinhard Selten who received Nobel Prize in 1994, there are less than 100 standard laboratories around the world to conduct the experiments. A laboratory in Chiang Mai University is one among them which learn the discipline from Goettingen Laboratory of Behavioral Economics under the supervision of Prof. Claudia Keser. Some studies that were done in the laboratory in Chiang Mai such as Songchoo and Suriya (2012).

Imitation is one of serious problems in the Thai economy in order to develop the innovation and protect intellectual property rights. The nature of the Thai does not place much value to original creativity as well as does not care much when someone's idea is imitated. As soon as the imitated product is cheaper than the genuine one, the Thai might support imitation.

This behavior destroys both creators and suppliers of new products. It deteriorates creativity in the Thai society. It breaks good relationships between entrepreneurs who might be good friends but once when one of them starts to imitate, the relationship turns to enemies. Even knowing the negative effects of imitation, the Thai cannot stop imitation.

One possible solution to fight imitation is social sanction to suppliers who imitate. When consumers band imitated products, then social pressure will allow only genuine products to enter the market. However, this hypothesis has still not been proven. We might expect the result hopefully but need to conduct an experiment to figure out whether it is true.

Therefore, this study will conduct an experiment to find the behavior of Thai producers to imitate other producers' products with and without social pressure on imitated products. It will test whether social pressure can significantly stop imitation or not. It will also figure out whether the imitators dare to launch new products after imitating other producers' products. Last, it will find the determinants of the decision to imitate which focuses on the market power of the final price setter.

2. The experiments

Rules of the game

- 1) There are 2 sides of players: the genuine product seller (Firm 1) and the imitated product seller (Firm 2). The buyer is participated in their decision making in the afternoon game.
- 2) The genuine product seller (Firm 1) is the first player beginning the game.
- 3) The genuine product seller (Firm 1) has only 1 option that is to sell the fixed price product.

- 4) The imitated product seller (Firm 2) has 2 options that are to sell the imitated product with the new price or not to sell the imitated product. If the imitated product seller (Firm 2) chooses “not to sell the imitated product“, then the game is over.

Game Procedure

The game was divided into 2 sessions: the morning session and the afternoon session. In the afternoon session, the buyer was participated by making the decisions. The morning session consisted of two different games: the first game and the second game. In the first game, the genuine product seller was the one who set the Final price and considers the decision of the imitated product seller (Firm 2) whether to imitate or not imitate the his/her product. In the second game, the imitated product seller was the one who set the Final price and considers the decision of the genuine product seller whether to sell or not sell the new product. The afternoon session also consisted of two different games that were the first game and the second game, but these games required the buyer’s decision. In the first game, the genuine product seller was the one who set the final price and consider the decision of the buyer whether to buy the genuine or the imitated one. In the second game, the imitated product seller was the one who set the final price and considers the decision of the buyer whether to buy the genuine or the imitated one.

To experiment playing this game, 48 players were participated (i.e. 24 players or 12 pairs in the morning session, and 24 players or 8 groups in the afternoon session). In the morning session, 12 players played as the genuine product sellers (Firm 1) and the other 12 players played as the imitated product sellers (Firm 2). In the afternoon session, 8 players played as the genuine product sellers (Firm 1), the other 8 players played as the imitated product sellers (Firm 2), and the last 8 players played as the buyers. The role of each player was randomly assigned by the experimenter in order to reduce the errors in the experimental processes.

Before starting the game, the experimenter described rules and conditions of the game to the players in order to help them understand and effectively play the game. Next, the players received the basic information card and game card, and then the experiment was begun according to the aforementioned procedure and rules. The experimental results were considered from the profits made by the players, and those profits were used to determine the prize of the winner (100 baht: 1 baht). The loser would get the lower prize value according to his/her losses.

By using the simulation game, the research could predict the trend of the samples’ decisional behavior with the economic statistic and econometrics for analyzing data and results of the experiment.

Data Collection

In this research, the experimental game was used to collect the primary data in terms of product imitation, undercut, and buyers’ decisional behavior. The samples were employees and students in Faculty of Economics, Chiang Mai University. The experiment was conducted in July 2011.

To collect the data that are the decisional behaviors of the sample in each scenario, the researcher separately conducted the experiments. In other words, the samples had to follow different rules and conditions of the game.

Data analysis

To analyze the experimental data that were quantitative, descriptive analysis, trend (of samples' decisional behaviors) analysis, and non-parametric statistical analysis were used. To analyze unmatched data, Wilcoxon-Mann-Whitney test was used. To analyze matched data, Wilcoxon-Signed-Rank test was used to compare the mean values.

In terms of econometrics, to examine the relationships or the influences that determine the decision to imitate the product, Logit Model for Panel data were used because this type of data could predict the decision to imitate the product according to the model below:

$$\text{Decision of a firm whether to imitate or not} = f ()$$

The dependent variables:

- Decision of a firm = 1: Imitate
- Decision of a firm = 0: Not imitate

The independent variables:

- Price setter = 1: Being the final price setter
- Price setter = 0: Not being the final price setter

3. Results

To analyze the experimental results of the product imitation game, the analysis can be divided into 2 parts, descriptive analysis of the decision to imitate and the analysis of Logit model for panel data to find the determinants of the decision to imitate.

Table 1. Decisions to imitate.

Settings of the game	Ratio of the decisions to imitate (%)
1. Genuine producers set the final price	
1.1 Without social pressure on imitated products	91.66
1.2 With social pressure on imitated products	75.00
2. Imitating producers set the final price	
1.1 Without social pressure on imitated products	75.00
1.2 With social pressure on imitated products	87.50

Source: Experiment.

According to the result in table 1, it found that firms imitate much even there are social pressure on imitated products. It means that the social pressure is an empty threat to imitators. In both cases no matter who will be the final price setter of the product in the market, the ratios of imitation are up to or higher than 75%. The situation is much worse when the imitating producers set the final price; the ratio goes up to 87.50%.

Table 2. Ratio of the decisions to launch new products of the imitators.

Settings of the game	Ratio of the decisions to launch new products (%)
1. Genuine producers set the final price	
1.1 Without social pressure on imitated products	50.00
1.2 With social pressure on imitated products	75.00
2. Imitating producers set the final price	
1.1 Without social pressure on imitated products	8.30
1.2 With social pressure on imitated products	87.50

Source: Experiment.

The result in table 2 shows the situation when imitators need to decide whether to launch new products or not. It finds that imitators seek the social pressure to be self-protection for the launching of new products. Without the social pressure, the decision to launch the new product is less (50%), especially in the case that the imitator has market power in setting the final price (8.3%).

Table 3. Decision to imitate analyzed by Logit model for panel data

Dependent Variable: Decision to imitate					
Variable	Coef.	Std. Err.	z	Prob > z	[95% Conf. Interval]
Price setter	8.9720	3.9852	2.25	0.024	1.1610 16.783
_Cons	-5.8258	3.0560	-1.91	0.057	-11.8155 0.1637
/lnsig2u	4.3207	0.2521			3.8266 4.8149
Sigma_u	8.6744	1.0935			6.7754 11.1056
Rho	0.9581	0.0101			0.9331 0.9740
Wald Chi-Squared					5.07
Log Likelihood					-7.2725
Prob > Chi2					0.0244
Likelihood-Ratio Test of Rho = 0					40.41
Chibar2					0.000

Source: Calculation Using Stata10

Market power is crucial for the decision to imitate. When a firm knows that they can set the final price, no other firms cannot set cheaper price, it tends to imitate the product. This market power may come from the distance of the genuine firm to the market that prevents the genuine firm to react. It might come from the image of the genuine producers that avoids the reduction of their prices. The cheaper price of the genuine products may harm the innovations more than being imitated. This is because the positioning of the genuine firm in the market on the upper market. Knowing such the lines of thought of this “no reaction” of the genuine firms, the imitators have rooms to imitate and sell at cheaper price.

4. Conclusions

This research examines the decisional behaviors through the experimental game of product imitation. It analyzes the effects of social pressure on purchasing imitated products on the decision to imitate the product. It also examines the factors that affect the decision to imitate the product.

According to the experimental results, it can be concluded that firms imitate much even there are social pressure on imitated products. It means that the social pressure is an empty threat to imitators. Moreover, that the price war discourages firms to launch new products again. Moreover, a firm which can set a final price of a product in a market place tends to imitate products of other firms.

It is therefore difficult for Thailand to develop her economy by innovation when social pressure cannot stop imitation and innovators tend to react nothing to imitators to keep their images and marketing positions. These behaviors might occur not only in the imitation of new products but also new services. Further studies might be conducted by turning from the case of industrial product to services such as rail transporter, tourism agencies, agro-industrial producers and organic agriculture as suggested by Suriya et al (2012), Suriya (2012), Kanjanatarakul and Suriya (2012a), Kanjanatarakul and Suriya (2012b) and Sudtasan and Suriya (2012) that these producers also needs to develop new services to their customers to strengthen their competitiveness too.

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