Factors Determining Decision on Purchasing Lottery: A Case Study in Greater Bangkok

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Abstract

In Thailand, illegal underground lotteries systems have long been popular and attractive to many Thai players. In attempting to solve this problem, Thai government has proposed to offer online lottery as an alternative to attract players away from the underground lottery. The purpose of this study is to investigate the influence of the proposed online lottery system and its effects on the behavior of lottery players. The study employs experimental survey method. A sample of 322 respondents is observed and analyzed employing Zero-inflated Poisson regression models. The estimated results show that buyers who currently play underground lottery have higher chance of purchasing online lottery. The study found that online lottery does not only poor substitute the underground lottery but also provides additional alternative for underground lottery buyer. Lottery buyers are more likely to prone to gambling addiction through the online lottery. Follows prospect theory, in a situation when player lose money in the game but with gross negligence of the risks, the player will continue to purchase lottery tickets in an attempt to recoup his/her losses. This implies that the online system had a tendency of being a bad influence causing its players addicted to gambling.

Keywords – Underground lottery; Online lottery; Experimental Survey; Zero Inflated Poisson model.

1. Introduction

In Thailand, lottery is not only entertainment but also the gambling channel for the Thai people. Thai government employs lottery as one source of government revenue for public welfare. However, due to limited alternative and offers, lottery has become too limited to some people. Although the underground lottery is prohibited as an illegal activity, it has long been popular and attractive to many Thai players because of their structure with variety of alternative, such as, percent rate of discount and availability of credit for purchase of lottery tickets. It generates tremendous amount of money, nearly half the GDP of the country in year 2003, moreover it has wide ranging economic and social effects on a lot of people. Missing out on the revenue generated from illegal lotto, the Thai government would like to create a new legal product such as online lottery which they hope will replace the underground system. Accordingly, this issue of online lottery become interesting whether it can be used to replace...
the famous illegal underground lottery. Therefore, the objective of this study is to analyse Thai consumer behaviour before and after the creation of the proposed online lottery and the viability of the online system as an alternative to the underground lottery as the Thai government hopes it will be.

2. Theoretical Framework

2.1. Maximize Utility Assumption

This study assumes that Thai gamblers also maximize their utility. Let’s assume the utility function as follows:

\[ Utility = U(X_1, X_2, X_3, ..., X_n) \]  

(1)

Refer to the general form of utility function as above, given that \( U_{ig} \) is the gambler utility \((i)\) who pay for \( g \) types of gamble (state lottery, underground lottery, online lottery and others)

\[ U_{ig} = U_{ig}(g_1, g_2, g_3, ..., g_n) \]  

(2)

\( U_{ig} \) explain the utility of gamble activities under the different characteristics variables and deterministic component \((V_{ig})\) of independent variable \((K_i)\), coefficients of the variables \((\beta)\) of gambler and the Random Error Component \((\varepsilon_{ig})\) can be written as following;

\[ U_{ig} = V_{ig} + \varepsilon_{ig} \]  

(3)

where: \( X'_{ig} = (x_{ig,1}, x_{ig,2}, ..., x_{ig,K}) \)’ represents vector of independent variables.

\[ \beta = (\beta_1, \beta_2, ..., \beta_K) \) represents vector of parameters.

Then, \( U_{ig} = X_{ig} \beta + \varepsilon_{ig} \)  

(4)

As a result, equation (4) states that gambling utility is based on \( X_{ig} \) and \( \beta \)

2.2. Poisson Regression Model

Since dependent variable in this study is reported as proportion and Poisson distributed, the Poisson regression model is employed and used to estimate the amount money left for consumption and saving of lottery buyer under the circumstantial online lottery. General Poisson models first assume that a random variable \( Y \) is said to have a Poisson distribution with parameter if it takes integer values \( y = 0, 1, 2, ... \) with probability

\[ P(Y_i = y_i \mid X_i) = \frac{e^{-\mu_i} \mu_i^{y_i}}{y_i !}, \quad y_i = 0, 1, 2, ... \]  

(5)

For \( \mu > 0 \). Mean and variance of this distribution can be stated as \( E(Y_i \mid X_i) = \mu_i = \exp(X_{ig}' \beta) \) where

\[ (X, \beta) = \left( \alpha_{ig} + \beta_{ig}AGE + \beta_{ig}DGEN + \beta_{ig}DSTAT_S + \beta_{ig}DSTAT_M + \beta_{ig}DCHILD + \beta_{ig}DINC \right) \]

\[ + \beta_{ig}DEDU + \beta_{ig}DFAC + \beta_{ig}DJOB_P + \beta_{ig}DJOB_M + \beta_{ig}DDEBT + \beta_{ig}DRA \]

\[ + \beta_{ig}DRP + \beta_{ig}EIC + \beta_{ig}EOB + \beta_{ig}EIG + \beta_{ig}EHM + \beta_{ig}LAI + \beta_{ig}D + \varepsilon_{ig} \]

where: \( \alpha_{ig} \) is constant term. \( \varepsilon_{ig} \) is error term. \( AGE \) is age of respondent. \( DGEN \) is dummy variable of the gender of respondent equal to 1 for male. \( DSTAT_S \) is dummy variable of single status of respondent equal to 1 for single. \( DSTAT_M \) is dummy variable for married status of respondent equal to 1 for married. \( DCHILD \) is dummy variable for number of children of respondent. \( DINC \) is monthly income average of respondent. \( DEDU \) is dummy variables of education of respondent. \( DFAC \) is field of study of respondent. \( DJOB_P \) is dummy variable of occupation of respondent equal to 1 for private officer. \( DJOB_M \) is dummy variable of occupation of respondent equal to 1 for own business. \( DDEBT \) is
dummy variable of debt of respondent. \( DRA \) is degree of risk aversion of respondent. \( DRP \) is risk perception of respondent. \( EIC \) is degree of illusion of control of respondent. \( EOB \) is degree of overconfidence bias of respondent. \( EIG \) is degree of entrapment in gambling games of respondent. \( EHM \) is degree of house money effect of respondent. \( LAI \) is degree of lottery analysis information of respondent. \( D \) is dummy variable equal to 0 for the scenario before online lottery is launched and equal to 1 for the scenario after online lottery is launched.

2.3. Zero-Inflated Poisson Models

Since many observations of dependent variable in this study are reported as zero, Zero-Inflated Poisson is also employed to determine the consumption of underground and online lottery. This model totally fit for the survey data which are the expenditure of underground and online lottery, excess zero count data and overdispersion problem.

3. Research Process

Data are observed using self-reported questionnaire. Demographic information includes nine inquiries concerning on age, gender, marital status, their children, monthly income average, education, branches, occupation and debt. The second part is a measure of the degree of risk aversion by choosing a lottery, in each 10 questions have two types of probability which were represented high (Risky Choice) and low risk (Safe Choice) then estimated degree of risk aversion by comparing with their relative risk aversion coefficient. The third section determines risk perception measurement, and the influence to the buyer lottery. The question was applied by the study of Stephen and John (2007). The psychology factors are divided into two parts: the psychology of gambling, which is divided into three factors: illusion of control, biased evaluation of outcomes and entrapment in gambling games. Psychology of investment factors include mental accounting bias and house money effect factor. This study also measure psychology variable effect to buyer lottery decision using 20 questions. The questionnaire is designed as 5 level of Likert scale; 1 - strongly disagree, 2 - disagree, 3 - indifferent, 4 - agree and 5 - strongly agree.

Online lottery scenario has been set to determine the opportunity to change in lottery spending behavior and how it change if Thai government already launched the online lottery project. The respondent is set up to face with two different situations, before and after the online lottery is launched. They have to determine their lottery expenditure before and after the implementation of the online lottery project as the proportion.

4. Empirical Result

The result was analyzed from 322 samples of field data. Table 1 shows the estimated results of underground lottery by Zero-Inflated Poisson model. Table 2 illustrates the estimation of online lottery by Zero-Inflated Poisson model. The empirical results show that the occurrence of online lottery will affect the changing in lottery expenditure and amount of money left for regular consumption and savings of buyers. Estimated results of Zero-Inflated Poisson show that if the online lottery project is truly implemented, the opportunity for a lottery player not to buy underground lottery is higher than the opportunity that lottery player to buy online lottery. This implies that under online lottery project the chance of lottery player to buy and not to buy underground lottery are almost equal, thus, online lottery project seems not to help reducing underground lottery buying behavior. Furthermore, current lottery buyers are more likely to purchase both online lottery and underground lottery. This finding indicates that online lottery project might cause the reverse effect that online lottery is not only a poor substitute to the underground lottery but is also likely to make buyers more prone to gambling addiction.

The results also indicate that amount of money left for regular consumption and savings of buyer lottery will be decreased under online lottery system. This result is consistent with the studies of Melissa (2005) who found that when a new product of gambling occurred (and the said product can not be substituted with the same types of gambling in the market), household consumption will reduce other expenditures such as rent, food and mortgage are cut before gambling expenditure is decreased. This study found that the amount left for consumption and savings of buyer lottery will be reduced with the implementation of the online lottery system.
Table 1 Estimated results of underground lottery by Zero-Inflated Poisson model

<table>
<thead>
<tr>
<th>Underground lottery</th>
<th>Poisson model</th>
<th>Logistic (Inflated)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>exp$(\beta)$</td>
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<tr>
<td>AGE</td>
<td>0.0303***</td>
<td>1.0307</td>
</tr>
<tr>
<td>DGEN</td>
<td>0.4269***</td>
<td>1.5325</td>
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<tr>
<td>DSTAT_S</td>
<td>-0.4292</td>
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<td>DSTAT_M</td>
<td>-0.1798</td>
<td>0.8355</td>
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<tr>
<td>D_CHILD</td>
<td>0.1019</td>
<td>1.1073</td>
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<tr>
<td>DJOB_M</td>
<td>0.7526***</td>
<td>2.1226</td>
</tr>
<tr>
<td>DJOB_P</td>
<td>0.0547</td>
<td>1.2056</td>
</tr>
<tr>
<td>DINC</td>
<td>-0.2402*</td>
<td>0.7864</td>
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<tr>
<td>DEDU</td>
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<td>0.9401</td>
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</tr>
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<td>0.8822</td>
</tr>
<tr>
<td>D_STAT_M</td>
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<td>1.3159</td>
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</tr>
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<tr>
<td>D_STAT_M</td>
<td>7.5635***</td>
<td>1926.5305</td>
</tr>
</tbody>
</table>

| Wald chi2(19) | 184.44 | Observations: 1926.5305 |
| Log Pseudo likelihood | -183133.7 | Zero observations: 1464 |
| Vuong Test | 0.456 | Nonzero observations: 456 |

Where: * is statistical significant at 0.1  ** is statistical significant at 0.05  *** is statistical significant at 0.01

Concerning on demographic variables, age, gender, income, education, occupation and debt, have significant impacts on the opportunity to buy underground lottery and online lottery. Considering on the debt factor, the study found that the chance that liable buyer who won’t pay for underground lottery is less than those of who pay underground lottery. This implies that liability will increase the opportunity to buy underground lottery.
Degree of risk perception of lottery buyer also affects the underground lottery expenditure. Lottery buyer with perceptible risk is more likely to play underground lottery. Under the online lottery system, perceptible risk buyers can maintain their money left for regular consumption and savings. Regarding on psychology factor, illusion of control variable (EIC) and entrapment in gambling games (EIG) have significant impacts on underground lottery expenditure while over confidence bias (EOB) has no impact.

According to prospect theory (David, Michael, & Law, 2005), the results show that in a gainful situation, lottery buyer who is the winner and get reward will be risk averse. On the contrary, under losing situation, most lottery buyer will turn to be a risk lover. Not only still in the game but they also continued to purchase lottery tickets in an attempt to recoup their losses. Because of lottery is unfair game, it is quite interested that almost all lottery buyers will turn to be risk lover and cannot leave from game. As a result, online lottery might lead its buyer to being addicted to lottery product or become gambling addicted.

5. Discussion

This study found two interest issues. Firstly, unidirectional expenditure of underground lottery, state lottery and online lottery that people who historically bought lottery, will tend to buy online lottery. The result also shows the opposite effects that online lottery does not only a poor substitute to the underground lottery but also make buyers more prone to gambling addiction. Secondly, the empirical result show that online lottery might have attractive characteristic in motivating people who never buy underground lottery or stated lottery to purchase online lottery. This implies that online lottery system has tendency of being a bad influence on lottery purchasing behaviour.

This study found that the amount left for consumption and savings of buyer lottery will be reduced under online lottery system. If government would like to replace online lottery in lottery market, the most important is the replaceable characteristic of production. Moreover, this study aim to show the effective factors which determining decision on purchasing lottery, we found that demographic variable, risk attitude, psychology factor and conviction in lottery analysis information will effect to the buyer lottery. The study also found that the behavior of consumers with regards to lottery products through prospect theory suggests that in a situation where you lose money in the game but with gross negligence of the risks, the player continued to purchase lottery tickets in an attempt to recoup his losses. As a result, online system had a tendency of being a bad influence on lottery products and its players as it might lead to gambling addicted.

References