

# PEER AND PATRONAGE EFFECT ON CONTRACEPTIVE USE IN INDONESIA

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## ABSTRACT

There are still marginal and limited studies on the effects of peer and patronage in the adoption of contraception and the choice of contraception method in Indonesia. This study aims at investigating whether peer and patronage factors influence the adoption of contraception and the choice of method in Indonesia. Drawing data from the Indonesian Population and Family Control Network and PODES (Village Potential Census) 2014, we applied a logit and ordered logit model to confirm the significance of the influence of peer and patronage alongside demographic and geographical factors tied to contraception behavior in Indonesia. Our results transcend those of earlier studies in demonstrating that peer and patronage effects accompany demographic factors in correlating with the decisions of Indonesian women to use contraception and their choice of method. It further suggests that the Indonesian government needs to incorporate an understanding of all factors influencing contraceptive decisions when formulating family planning policies. By doing so, it could create a bandwagon effect that reduces birth rates.

**Keywords:** Contraceptive choice; Peer effects; Patronage effect; Family planning; Household behavior.

## 1. INTRODUCTION

Indonesia is the fourth most populous country in the world. By 2017 the population was estimated at around 263 Million.<sup>1</sup> The large population is as a result of a high total fertility rate (TFR henceforth) that exceeds the replacement level.<sup>2</sup> Even though Indonesia has experienced a decrease of nearly half the TFR during the last four decades, the current TFR (2.4) is still higher than the replacement rate.<sup>3</sup> Therefore, the current TFR shows that the population would be continuously growing. A significant decrease in TFR is most likely due to the significant increase in contraceptive prevalence rate as reported in the 2012 Demographic and Health Survey (*Survei Demografidan Kesehatan Indonesia*).

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<sup>1</sup> <http://www.worldometers.info/world-population/population-by-country/>

<sup>2</sup> Total fertility rate (TFR) represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year (15–49 years).

<sup>3</sup> <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN>

Issues on TFR in Indonesia have been massively explored by economists, demographers, and other social scientists such as Adioetomo (1983), Hull (1987, 2003, 2007, 2015), Hull and Hartanto (2009), Majumder and Ram (2015). Most of previous researches in Indonesia mainly investigate socio-demographic characteristics of childbearing age couples while disregarding the influence of peers and prominent community figures on their choices. However, Manski (2000) argues that the people's decisions can be due to three important factors: equating own perceptions with others, intention or interest to be like others, and existing elements of paternalism. Rogers (2003) also finds that in adopting an idea, practice, or object, people are influenced by the behavior of their peers. In the international context, Ali, Amialchuk and Dwyer (2011) empirically show that social networks have significant effects on contraceptive behavior among adolescents. Thompson and Spainer (1978) investigated the relative influences of parents, peers, and partners on the contraceptive use of U.S. college men and women.

Previously there existed the perception that people would only be only concerned with him/herself during making decision processes. An individual's behavior or decision could be significantly influenced by other people in the same group- the so called peer effect. This behavior exists when uncertainties whether to adopt or buy a new thing are involved in a particular behavior. The peer effect becomes a bandwagon effect when people imitate the majority. The bandwagon effect reflects the tendency of individuals to behave in similarity to the trends created by the majority within a group, so that individual behavior is likely to be independent of their own beliefs. Sociologists find the peer and bandwagon effects significant because they explain behavior where no discernible information otherwise explains people's actions (Xiong, Payne, & Kinsella, 2016). Many studies have shown that the tendency of individual behavior or decisions to follow a new item or innovation is based on peer effects (Sacerdote, 2001; Dahl, Loken, & Mogstad, 2014). Moreover, individual decision could be influenced by not only by the peers but also by the presence of a central figure (patronage) in a community. Banerjee, Chandrasekhar, Duflo, & Jackson (2014) noted that people also imitate the behavior of prominent community figures. These figures become nodes for information that is deemed to be important because of their stature, a phenomenon called the patronage effect. Social scientists argue that people imitate peers and prominent community figures in making decisions (Bariagaber, 2013).

This study complements the conventional documentation of demographic and geographic characteristics as important determinants of TFR; it aims at investigating whether peer and patronage effects influence the adoption of contraception and the choice of method in Indonesia. This study hypothesizes that the choice of contraceptive use by peers, and patronage roles in the society would significantly affect individual decision in contraceptive use. If peer and patronage have a significant effect on the contraceptive choice, then the study will be a call for policy reform toward promoting family planning in Indonesia.

This study proceeds as follows. Section 2 reviews research methods and empirical strategies of earlier studies. Section 3 discusses our method. Section 4 presents descriptive statistics and results of econometric estimations. Section 5 recommends policies. Section 6 concludes.

## 2. LITERATURE REVIEW

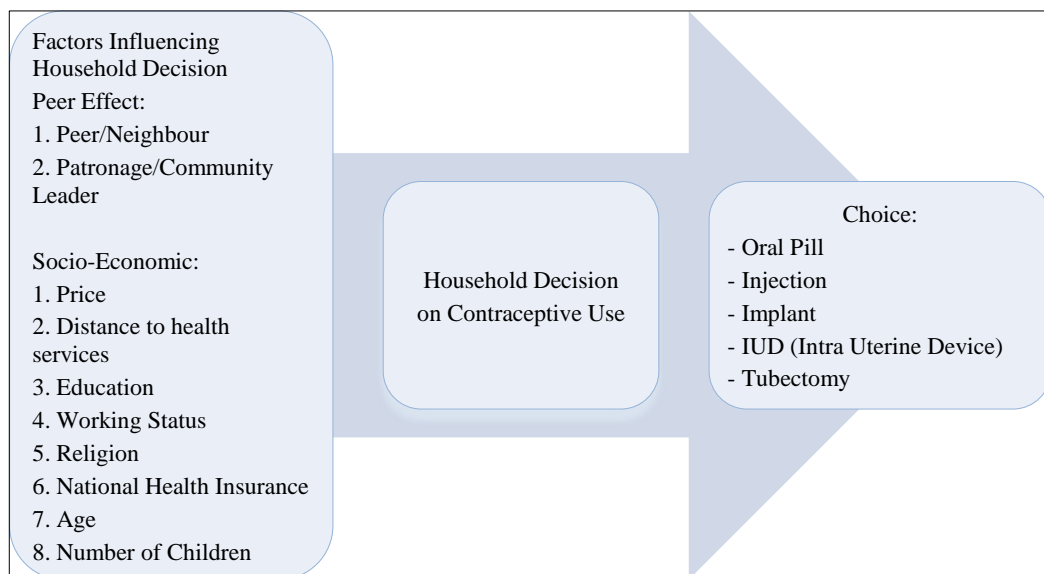
Childbearing age couples search for information to help them decide whether to use a contraceptive or not. In case they decide to use a contraceptive, then the next question would be what type of contraceptive; pill, injection, implant and tubectomy, they should use. In the absence of perfect information, couples probably seek information from colleagues, neighbors, community leaders, and/ or relatives. In the social network, word-of-mouth (WoM) would be an important channel for spreading information concerning new products and issues that influence people in the adoption of a new method or purchase of some products. Luan and Neslin (2009) found that WoM has a persuasive and informative effect on the U.S. video game market. Moreover, the “opinion leaders” also have an important role in spreading information (Van Eck, Jager and Leeflang, 2011). Moreover, couples or individuals may typically learn the neighbor’s experience to achieve a better understanding and thus make a better-informed adoption decision on contraceptive use. Contraception arises from the need to prevent pregnancy during intervals between births. In deciding to adopt contraception, women might follow the example of peers and prominent figures in the community, and act when a majority trend becomes clear. Peers/neighbors or patronage spread information about their experiences of using a specific type of contraception; other people can then easily imitate them and use the same type of contraception, reducing the cost of gathering information. When the society as a whole begins to do the same thing then another person naturally follows that kind of behavior (Xiong, Payne & Kinsella, 2016).

This study defines the peer effect as the various influences that an individual receives from other individuals in the same group on taking a particular action (Xiong, Payne, & Kinsella, 2016).. Xiong et al. (2016) propose three basic mechanisms that explain the role of peer effects in the diffusion of innovations namely, the information effect, experience effect and externality effect. The information effect (transmission) is whereby an individual is informed about the adoption of new methods by peers. The information provides an awareness, which creates an extra choice for the individual to consider when selecting a contraceptive choice. The second mechanism is the experience effect, whereby an individual is advanced, either materially or psychologically, by peers who have already adopted the innovation or used the contraceptive. The knowledge and resources learned from peers can help her/him to mitigate uncertainty or to reduce the cost of searching for new innovations or using the contraceptive. The externality effect is when an individual is coerced by peers, either individually or collectively, to adopt or not to adopt an innovation or the contraceptive because a substantial proportion of his/her peers have already adopted or used it.

In the decision making process, there is a tendency of bandwagon effect to come in, whereby an individual will behave parallel with the trend that is created by the mass populous, regardless of their own belief. For instance, if most people in a society have a xyz Smartphone, then other people without smart phones would most likely buy the xyz Smartphone in order to be considered as part of a group. Moreover, in a group of people, sometimes there is a respected person, a role model, an informal leader, or a community leader. Martiskainen (2017) found that community leadership can aid the development of grassroots innovations through social networks, shared vision and decision making. The leader’s skills and tacit knowledge also play a role in the development of grassroots innovations.

Previous studies on contraceptive use suggest that demographic variables such as age and education have a positive effect on contraceptive choices (Rosenzweig & Seiver, 1982; Frankenberg, Sikoki, & Suriastini, 2003; Widji, 2009). Nakamura (2013) confirms that age has an effect on oral contraception (Nakamura, 2013); Frankenberg, Sikoki, & Suriastini (2003) mention that the employment status weakly influences the choice of contraceptives; while Widji (2009) shows different results in which there is a positive influence between the employment and contraceptive options. A couple or individual does not necessarily rely on objective information during decision making. Myths and misinformation among women, their partners, and their communities prevent the use of appropriate and sustainable contraception (Nettleman, Chung, Brewer, Ayoola, & Reed, 2007).

**Figure 1:** The Decision on Contraceptive Use Concept



*Source:* Authors

In the economic field, individual utility is affected by the consumption of physical commodities, psychological attitudes, peer group pressures, personal experiences, and the general cultural environment. Sadoulet and Janvry (1995) took an economic approach to contraception, treating the decision to use it just as one would treat the consumption of conventional goods and services. Any decision in a household is economically based on the motivation to maximize utility, and is constrained by the existing cost problem (Rosenzweig & Seiver, 1982). Economists analyze consumption using variables such as relative prices, real income, demographic characteristics (age, education, job status, household composition), and locale. Households choose contraception based on their income, product prices, and other factors that could influence the decision namely, prior knowledge, peer effect, location, cultural norms and religious belief (Figure 1). Moreover, the choice of contraceptive may also be influenced by the geographical areas. For instance, those living

in mountainous areas will have different contraceptive preferences compared to those living in coastal areas due to some reasons.

### 3. RESEARCH METHOD

Based on the literature review and previous research, this study hypothesizes that households or couples' decision on contraceptive use is influenced not only by socio-demographic variables but also by peer effects. This study then applies econometric analysis to estimate whether peer and patronage phenomena have significantly affected contraceptive use decisions in Indonesia. If so, the results could inform government policy on the reduction of birth rates in Indonesia. This study applies logistic regression ordered logit regression to assess whether there is a relationship between peer and patronage, and contraceptive use in households. The logistic regression will evaluate whether peer and patronage have an effect on household decisions about using or not using contraception, while the ordered logit regression will assess whether the peer and patronage has an effect on household decisions on how to choose contraception in terms of duration and type; for instance the choice between the oral-pill and injection (short term- daily and monthly basis), implant and IUD (medium term-1–5 years), or long term (permanent).

Using logit regression, we identify factors that influence contraception use as independent variables. The dependent variable is a dummy that takes the value of 1 for a decision to use contraception and 0 otherwise. The next step in defining a model for our data is through the use of a systematic structure. We would like to have the probabilities  $y_i$  depend on a vector of observed covariates  $x_i$ .

$$y_i = x_i \beta \quad (1)$$

Where  $y_i$  is a contraceptive use (1: yes, 0: no),  $\beta$  is a vector of regression coefficients, and  $x$  is a vector of explanatory variables including peer (PEER), socioeconomic (SOCEC), and demographic (DEM). Equation 1 can be transformed into the following equation:

$$\log \left( \frac{y_i}{1-y_i} \right) = \beta_0 + \beta_1 PEER_i + \sum_{j=1}^J \beta_j SOCEC_{ji} + \sum_{k=1}^K \beta_k SOCEC_{ki} \quad (2)$$

This model is drawn from prior studies on peer effects and centrality theory (Rogers, 2003; Banerjee, Chandrasekhar, Duflo, & Jackson, 2014; Xiong, Payne, & Kinsella 2016; Rosenzweig & Seiver, 1982; Frankenberg, Sikoki, & Suriastini, 2003; Nakamura, 2013).

We then employ an ordered logit model (OLM) to test explanatory variables and the choice of type of contraceptive methods. This is because the dependent variable has an order of five modes of contraception: daily (pill-oral contraceptive), monthly (injection), three years (implant), five years (IUD), and permanent (tubectomy). The regression captures contraceptive choice from the short term to the long term with ordered response models comprising of five outcomes, ( $y = 1,2,3,4,5$ ). In order to explain an ordered response model, we follow the general form provided by Wooldridge

(2002). The ordered probit model for  $y$  (conditional on explanatory variable  $x$ ) can be derived from a latent variable model. The empirical specification of OLM is the following:

$$y_i = \beta_0 + \beta_1 PEER_i + \beta_2 Patronage_i + \sum_{j=1}^J \beta_j SOCEC_{ji} + \sum_{k=1}^K \beta_k SOCEC_{ki} \quad (3)$$

Eq. 2 and Eq. 3 will be estimated using the family census data of 2015 collected by the National Agency of Population and Family Planning (BKKBN) (for detailed explanation see BKKBN, 2015)) and the PODES (National Village Census) 2014. The PODES data contains census data collected by Central Statistical Agency every three years. This study was only limited to the data of Pati Regency, Central Java, Indonesia.<sup>4</sup>This census recorded 358,923 households consists of 204,266 childbearing age household (age ranging from 15 to 49 years old). Among the childbearing age households, 172,528 households (either men or women) used contraceptives for family planning. This study combines both the census data and PODES that are intended to capture the effect of health service availability on the contraceptive choice. This is because the census data did not record any information on health service availability at the village level.

**Table 1:** Description of Variables of Contraception Use in the Logistic Method

| Variables         | Description                                                          | Mean  | Expected Sign |
|-------------------|----------------------------------------------------------------------|-------|---------------|
| Contraceptive Use | (The dummy variable, contraceptive use = 1; otherwise = 0)           | 0.84  |               |
| Peer              | (Proportion percentage of contraceptive use at community (RW) level) | 84.43 | +             |
| Distance          | (Distance to health service place)                                   | 4.1   | +/-           |
| JKN               | (JKN member, 1= yes, 0 = otherwise)                                  | 0.41  | +             |
| Age               | (Age)                                                                | 35.8  | +/-           |
| Child             | (The dummy variable number of child, less than 3 = 1; otherwise = 0) | 0.85  | +/-           |
| Educ_El           | (Compulsory 9 years education, 1 = completed; otherwise = 0)         | 0.64  | +             |
| Educ_SH           | (Secondary and higher education, 1 = completed; otherwise = 0)       | 0.29  | +             |
| Working           | (The dummy variable working woman, working = 1; otherwise = 0)       | 0.81  | +             |
| Religion          | (The dummy variable affiliation, Moslem = 1; otherwise = 0)          | 0.98  | +             |

*Source:* Authors' calculation based on the 2015 BKKBN dataset

Eq. 2 estimates the relationship between peer effects and the use of contraceptives. This study defines “peer” as the proportion of members of the childbearing age group using contraceptives within a community area (RW-*RukunWarga*) (excluding individual-*i*) in the village level, divided

<sup>4</sup>BKKBN (National Agency of Population and Family Planning-*BadanKependudukanKeluargaBerencana Nasional*) conducted the national family planning census in 2015. However, due to the limited access of data, this study only used a single region data of Pati Regency.

by the total childbearing age. A community area (RW) often includes around 100–200 households. For example, if there are 50 childbearing age group using contraceptives in a community area (excluding individual-i) with 100 households of childbearing age, then the size of the peer is 50% (50 divided by 100). Peer describes the average number of members of childbearing age who use a contraceptive at a community area. This study purports that the individual choice decision to use a contraceptive and the choice of contraceptive are positively correlated with the peer behaviors. Table 1 provides the descriptive statistics of the data used for estimating Eq. 2.

Eq. 3 will be estimated using a subset data for the childbearing age that is limited for women only. We only include the data that has a community leader promoting family planning at village (*Pembantu Pembina Keluarga Berencana Desa (PPKBD)-Patronage*). This study uses PPKBD/Patronage as a proxy for patronage since they are most likely to represent a community leader who first used contraception relative to the method's acceptors in a village. Patronage is a local public figure that has the role of spreading information about family planning. This study expects that when a community leader has used a type of contraception in form of patronage, then a childbearing age woman is most likely to follow the choice made by the patronage. This study treats the patronage's choice of a contraceptive not as a pure dummy variable but as a single variable since a patronage's choice represents a time horizon of contraceptive choice from a daily basis to permanent choice. We, therefore, could only observe around 45,541 women of childbearing age. Among them, 21,492 women among them were actively using contraceptives. Table 2 shows the descriptive statistics obtained for the data for the OLM.

**Table 2:** Description Variable of Contraception Choice in Ordered Logit Model

| Variable  | Description                                                                                                                       | Mean  | Expected Sign |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| Choice    | (contraceptive choice 1= Pill/Oral; 2= injection; 3= Implant; 4= IUD; 5= tubectomy)                                               | 2.05  |               |
| Peer      | (Proportion percentage of contraceptive use at community (RW) level)                                                              | 2.07  | +             |
| Patronage | (Contraceptive used by community leader of family planning (PPKBD), 1= Pill/Oral; 2= injection; 3= Implant; 4= IUD; 5= tubectomy) | 2.62  | +             |
| Price     | (Price of contraceptive)                                                                                                          | 5.7   | +/-           |
| Distance  | (Distance from village to health care services for contraceptive)                                                                 | 4.48  | +             |
| JKN       | (JKN member, 1=yes, 0=no)                                                                                                         | 0.4   | +             |
| Age       | (Age)                                                                                                                             | 34.58 | +/-           |
| Child     | (The dummy variable number of child, less than 3 = 1; otherwise = 0)                                                              | 0.84  | +/-           |
| Educ_EI   | (Compulsory 9 years education, 1 = completed; otherwise = 0)                                                                      | 0.66  | +             |
| Educ_SH   | (Secondary and higher education, 1 = completed; otherwise = 0)                                                                    | 0.29  | +             |
| Working   | (The dummy variable working women, working = 1; otherwise = 0)                                                                    | 0.76  | +             |

| Variable | Description                                                               | Mean | Expected Sign |
|----------|---------------------------------------------------------------------------|------|---------------|
| Religion | (The dummy variable of religious affiliation, Moslems = 1; otherwise = 0) | 0.98 | -             |

*Source:* Authors' calculation based on the 2015 BKKBN dataset

In order to check the consistency and robustness of the estimation, this study classifies respondents into three groups based on geographic characteristics: area 1 (11 sub-districts-*Kecamatan*) is mountainous, area 2 (four sub-districts) consists of lowland or city areas while area 3 (six sub-districts), is coastal area. We divided the geographical locations of the study into three areas due to the fact that the behavior of people in the three areas would be different because of different cultures, customs, and systems of beliefs. The coastal area is most likely to be dominated by the Islamic culture, while the mountainous area is dominated by agricultural and traditionally Javanese culture. The lowland area is an urban area.

#### 4. RESULTS AND DISCUSSION

Our estimation on logistic regression (Table 4) confirms that households' choice on whether or not to use contraception is influenced by their peers or the behaviors of the people surrounding them. If contraception use at community (RW)'s level is increasing, then it will attract other women to use contraception. The probability that a woman will use contraception rises by 0.68 percent for each additional percentage of peers who use contraception. This percentage can be described as the transmission of peer effect (Xiong, Payne, & Kinsella, 2016), which denotes the process of duplicating group behavior by individual. There are two possible reasons why peer effects influence individual decisions on contraceptive use. The first is the bandwagon effect, which is the individual's tendency to behave in line with a trend that has been created by their group. Therefore, if most of the group members are using contraceptives, then there will be peer pressure for the individual to also use the contraceptive. Secondly, the individual may take the strategy of learning from neighbors' experience (social learning) in order to reduce the searching cost of information collection and to acquire better quality of information in the adoption of a contraceptive.

All control variables were found statistically significant in influencing the decision to use contraceptives or not. For instance, those having national health insurance (JKN) tend to use contraceptives because JKN covers the cost of contraception. JKN therefore increases the probability of using contraceptive by 1.1 percent. Educated and working women also tend to use contraceptives. Women with secondary and higher education have a higher probability of using contraceptive by 2.5 percentage point compared to those never attended school.



**Table 4:** Estimation Results of Logit Regression

| Variables             |                                                                                  | Coefficient          | Marginal Effect        |
|-----------------------|----------------------------------------------------------------------------------|----------------------|------------------------|
| Peer                  | (Proportion percentage of contraceptive use at Sub-village (RW)/community level) | 0.060***<br>(0.005)  | 0.007 ***<br>(0.000)   |
| Distance              | (Distance to health care services)                                               | 0.007***<br>(0.002)  | 0.001 ***<br>(0.000)   |
| JKN                   | (JKN member's)                                                                   | 0.09***<br>(0.138)   | 0.011 ***<br>(0.002)   |
| Age                   | (Age)                                                                            | 0.003***<br>(0.001)  | 0.0004 ***<br>(0.000)  |
| Child                 | (The dummy variable member of child, less than 3=1; otherwise=0)                 | -0.460***<br>(0.022) | -0.047 ***<br>(0.002)  |
| Educ_E1               | (Compulsory 9 years education, 1 = completed; otherwise = 0)                     | 0.500***<br>(0.025)  | 0.061 ***<br>(0.003)   |
| Educ_SH               | (Secondary and higher education, 1 = completed; otherwise = 0)                   | 0.230***<br>(0.026)  | 0.025 ***<br>(0.003)   |
| Working               | (The dummy variable of working women, working = 1; otherwise = 0)                | 0.010***<br>(0.002)  | 0.001<br>(0.002)       |
| Religion              | (The dummy variable of religious affiliation, Moslem =1; otherwise=0)            | 0.140***<br>(0.044)  | 0.0172 ***<br>(0.0056) |
| Intercept             |                                                                                  | -3.460***<br>(0.079) |                        |
| Observation           |                                                                                  | 204,184              |                        |
| Wald Chi-Square       |                                                                                  | 17,267.02            |                        |
| Pseudo R <sup>2</sup> |                                                                                  | 0.1512               |                        |

\*\*\* is significant at  $p < 0.01$ , \*\* is significant at  $p < 0.05$ , \* is significant at  $p < 0.1$

Figures in parenthesis are standard errors

Ordered logit regression yields the same conclusion: peer influence which was represented by the average contraception use in the community, has a strong effect on individual choice of contraception. Interestingly peer effects are strongly influencing individual choice of contraceptive types in mountainous area compared to lowland/city area. This is because women living in the lowland/city area are more individualistic and highly exposed to information on contraceptives and family planning. Women in the city area seek information from other credible sources instead of depending on their peers. On the other hand, since the culture of the mountainous area is more communal and characterized by a general lack of information, the women rely on their peers to seek information. WoM often dominates the transmission of information. Therefore, there is a tendency for the bandwagon effect to be prevalent in this area. The knowledge and resources learned from the peers can help individuals to mitigate the uncertainty or reduce costs associated with searching for information cost on contraceptive usage.

This research seeks not merely relations but also causality, to acquire an accurate understanding of whether the patronage of a pioneering contraception user affects the percentage of acceptors in her

environment. Results show that if patronage uses long-term contraception, others are likely to do so. Contraceptive choice among prominent people (patronage) at the sub-village level also significantly affects the choice of other women in that sub-village. Furthermore, results reveal geographic differences in preferred contraceptive methods. Surprisingly this effect only exists significantly in lowland/city and coastal area.

The possible link between the patronage (PPKBD or prominent people) and the use of contraceptives is the experience effect. Xiong, Payne, & Kinsella (2016) show that when basic information about contraception or innovation cannot motivate an individual's adoption decision, she will wait until other individuals have tried and he/she can obtain more detail information. Before an individual at the community level decides to use either short-term or long-term types of contraceptive, she will observe older people/local community leaders' experiences of using contraceptives. She would comprehensively compare information about the negative and positive effects of using short-term or long-term contraceptives from early adopters. Any woman who considers adopting either short-term or long-term contraceptives is mainly concerned with whether it is a more beneficial and safer protection with fewer negative effects.

Other interesting findings are: 1) When the price of contraception rises, women prefer long-term contraceptive methods since using long-term contraceptive reduces the monthly average cost of birth controlling; 2) when accessibility to contraceptive services declines due to shorter distance, women prefer short-term contraception (e.g., the pill and injections); 3) attaining senior high school and university education increases the probability of women using long-term contraception; 4) religion is statistically irrelevant to the choice of contraceptive method.

**Table 5: Results of Ordered Logit Regression in Contraceptive Choice**

| Variables | Description                                                                       | All Area<br>Coefficient | Mountainous Area<br>Coefficient | Lowland Area<br>Coefficient | Coastal Area<br>Coefficient |
|-----------|-----------------------------------------------------------------------------------|-------------------------|---------------------------------|-----------------------------|-----------------------------|
| peer1     | (Average Contraceptive Use at RW's level excluding herself)                       | 2.56***<br>(0.11)       | 3.36***<br>(0.213)              | 1.61***<br>(0.334)          | 2.34***<br>(0.147)          |
| Patronage | (Contraceptive used by PPKBD, 1=Pill; 2=Injection; 3=Implant; 4=IUD; 5=Tubectomy) | 0.08***<br>(0.010)      | 0.005<br>(0.026)                | 0.13**<br>(0.044)           | 0.06***<br>(0.016)          |
| Price     | (Contraceptive Price based on clinic status; Government or Private)               | 0.49***<br>(0.01)       | 0.53***<br>(0.225)              | 0.53***<br>(0.026)          | 0.54***<br>(0.015)          |

| Variables | Description                                                            | All Area<br>Coefficient | Mountainous Area<br>Coefficient | Lowland Area<br>Coefficient | Coastal Area<br>Coefficient |
|-----------|------------------------------------------------------------------------|-------------------------|---------------------------------|-----------------------------|-----------------------------|
| Distance  | (Distance to health care services)                                     | -0.1***<br>(0.01)       | -0.04***<br>(0.009)             | -0.07***<br>(0.016)         | -0.21***<br>(0.012)         |
| JKN       | (JKN member, 1= yes, 0= other)                                         | 0.17***<br>(0.04)       | 0.04<br>(0.077)                 | 0.01<br>(0.095)             | 0.15***<br>(0.046)          |
| Age       | (Age)                                                                  | -0.03***<br>(0.00)      | -0.03***<br>(0.005)             | -0.04***<br>(0.007)         | -0.03***<br>(0.003)         |
| Child     | (The dummy variable number of child, less than 3 =1; otherwise=0)      | -0.85***<br>(0.06)      | -0.92 ***<br>(0.137)            | -0.74***<br>(0.144)         | -0.80***<br>(0.078)         |
| Educ_E1   | (Compulsory 9 years education, 1 = completed; otherwise = 0)           | 0.42***<br>(0.09)       | 0.42**<br>(0.141)               | 0.19<br>(0.195)             | 0.49***<br>(0.137)          |
| Educ_SH   | (Secondary and higher education, 1 = completed; otherwise = 0)         | 0.59***<br>(0.09)       | 0.66***<br>(0.153)              | 0.40<br>(0.202)             | 0.67***<br>(0.14)           |
| Working   | (The dummy variable of working woman, working = 1; otherwise = 0)      | -0.02<br>(0.04)         | -0.01<br>(0.126)                | 0.33*<br>(0.132)            | 0.05<br>(0.048)             |
| Religion  | (The dummy variable of religious affiliation, Moslems =1; otherwise=0) | -0.26<br>(0.14)         | -0.2<br>(0.306)                 | -0.12<br>(0.496)            | -0.26<br>(0.157)            |
| /Cut1     |                                                                        | 3.739<br>(0.31)         | 6.223<br>(0.661)                | 2.669<br>(0.932)            | 3.20<br>(0.405)             |
| /Cut2     |                                                                        | 9.047<br>(0.32)         | 11.795<br>(0.691)               | 7.912<br>(0.952)            | 8.557<br>(0.418)            |
| /Cut3     |                                                                        | 9.504<br>(0.33)         | 12.47<br>(0.70)                 | 8.373<br>(0.956)            | 8.951<br>(0.422)            |
| /Cut4     |                                                                        | 2.00                    | 13.188                          | 9.47                        | 9.61                        |

| Variables             | Description | All Area<br>Coefficient | Mountainous Area<br>Coefficient | Lowland Area<br>Coefficient | Coastal Area<br>Coefficient |
|-----------------------|-------------|-------------------------|---------------------------------|-----------------------------|-----------------------------|
|                       |             | (0.33)                  | (0.706)                         | (0.964)                     | (0.421)                     |
| #Observations         |             | 21,492                  | 5,643                           | 3,592                       | 12,257                      |
| Wald Chi-Square       |             | 3,236                   | 848.43                          | 485.96                      | 2,052.7                     |
| Pseudo R <sup>2</sup> |             | 0.128                   | 0.137                           | 0.114                       | 0.146                       |

\*\*\* is significant at  $p < 0.01$ , \*\* is significant at  $p < 0.05$ , \* is significant at  $p < 0.1$

Figures in parenthesis are standard errors

## 5. CONCLUSIONS

### 5.1. Conclusions

Our results transcend those of earlier studies in demonstrating that peer and patronage effects accompany demographic factors associated with the decisions of Indonesian women to use contraception and their choice of method. An increase in contraception usage at the community (RW)'s level will attract other women to use contraception. The probability that a woman will use contraception rises by 0.68 percentage points for each additional peer who uses contraception (Table 4). There also exists a bandwagon effect that an individual will behave parallel to the trend that is created by their group. The peer effect may also provide social learning in which the individual takes the learning strategy from neighbors' experiences in order to reduce uncertainty and the cost of searching for information about contraceptive adoption. Moreover, this study also confirms that patronage, as represented by PPKBD has a significant effect in influencing community women to use contraceptives. If patronage uses long-term contraception, others are also likely do so. The effect of experience effect would be the most plausible reason for explaining this relationship. Women will wait until another individual/prominent person has tried and he/she can obtain more detailed information about the positive and negative effects of each contraceptive type.

### 5.2. Implications

The findings further suggest that the Indonesian government needs to incorporate an understanding of all factors associating with contraceptive decisions when formulating family planning policies. Several policy recommendations emerge from this study: 1) Indonesian government should realize that the use of contraception is influenced by peer and patronage effects, demographics, and geographic considerations; 2) The government should identify prominent community figures for their role as information nodes influencing contraceptive use; 3) Policy-makers should also regard peer-to-peer interactions as a chance to build social capital with regard to contraception.

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