



## Research Article

© 2023 Wilson Rajagukguk & Fajar Lamhot Gultom & Muhammad Alfarabi  
This is an open access article licensed under the Creative Commons  
Attribution-NonCommercial 4.0 International License  
(<https://creativecommons.org/licenses/by-nc/4.0/>)

### The Nexus between Economic Features and Contraceptive Switching in Indonesia

**Wilson Rajagukguk**

*Universitas Kristen Indonesia, Jakarta, Indonesia*

**Fajar Lamhot Gultom**

*Universitas Kristen Indonesia, Jakarta, Indonesia*

**Muhammad Alfarabi**

*Universitas Kristen Indonesia, Jakarta, Indonesia*

DOI: <https://doi.org/10.2478/bjir-2023-0016>

#### Abstract

**Objective:** This study aims to examine the association between economic characteristics and contraceptive switching in Indonesia.

**Methods:** The study employed monthly contraceptive calendar data from the results of the 2017 Indonesia Demographic and Health Survey. The unit analyzed the contraceptive use during 3-62 months in women of the age between 15-49. The data was analyzed using a Gompertz proportional hazards model. The dependent variable was the duration of the risk period up to the incidence of the contraceptive switching. Main used variables were based on economic, demographic and sociocultural factors.

**Results:** The 12-month contraceptive switching rate was higher among women who had a cellular phone, a bank account, ever used the internet in the last year, were currently employed and came from households in highest wealth quintile. These economic features significantly influenced the risk of switching contraception in Indonesia after controlling for demographic and sociocultural factors.

**Conclusions:** After controlling for demographic and sociocultural factors, a higher risk of contraceptive switching was associated with having a cellular phone and bank account and being from households in highest wealth quintile. Higher contraceptive switching risk was also associated with switching contraceptive pills, intent of limiting births, having two or three children, being of age 15-24 years, having higher education, having exposure to family planning messages via internet, having husbands who decided about the wife's earnings, earning more than husband and not owning a house. The nexus between better economic status and contraceptive switching may imply the need to formulate and implement suitable

family planning policies and strategies to reduce contraceptive switching among the better-off economically and more empowered women in order to prevent unwanted births.

**Keywords:** Economic, Demographic, Sociocultural, Contraception, Family planning services, Indonesia.

## 1. Introduction

One of the most important family development issues in Indonesia is high unwanted births. In 2017, about seven percent of births in Indonesia were not wanted (BKKBN et al. 2018). They can be attributed to high contraceptive discontinuation. Almost 29% of contraceptive use episodes were discontinued within 12 months (BKKBN et al. 2018). Almost half of these contraceptive discontinuation was switched to another method.

Contraceptive discontinuation can be caused by several reasons, such as method failure, desire to get pregnant, other fertility-related causes, side effects or health concerns, desire of a more effective method and other method-related motives. A woman may discontinue a certain contraceptive method because the method is difficult to be used or the use of the method is not suitable or because of her partner. As a result, the woman may switch the use of contraception to the more suitable method that often is more effective (Bradley et al, 2009; Castle and Askew, 2015).

The study of contraceptive switching is important. A woman who does not switch after a contraceptive discontinuation, beside wanting to get pregnant, is at risk of unplanned pregnancy or unwanted births. Castle and Askew (2015) emphasized the importance of contraceptive switching among women who discontinue a contraceptive use. Women must continue the protection against unplanned pregnancies by using a more accepted and effective contraceptive method if they experience problems in using a method of contraception. A study by Hamill et al. (1990) found that in rural areas in Sri Lanka, a significant proportion of women who had achieved their desired fertility tended to switch a more effective method.

The reason to switch a contraception is very complex. However, all determinants of contraceptive switching can be categorized in some characteristics (Curtis and Blanc, 1997). These determinants include economic, demographic, and sociocultural factors (Curtis and Blanc 1997, Hamill et al. 1990; Grady et al. 2002).

Some studies have been carried out to investigate the determinants of contraceptive switching (Hamill et al. 1990; Samosir 1994; Curtis and Blanc, 1997; Samosir 1997; Grady et al. 2002; Arifin 2003; Ali and Cleland 2010; Wang and Hong 2017; Barden-O'Fallon et al. 2018; Simmons et al. 2019). These studies found that demographic and socioeconomic factors were significantly associated with contraceptive switching.

Later studies (e.g. Samosir et al. 2020; Rachmawati and Samosir 2022) included more economic factors, such as ownership of a cellular telephone and use of the internet, and more cultural factors, such as women's participation in household decision making, that reflected current development, in the study of the determinants of contraceptive discontinuation and switching. However, study on the association between economic,

demographic, and sociocultural factors and contraceptive switching in Indonesia that incorporated other new economic features, such as ownership of a bank account, and cultural factors, such as control over cash earnings and ownership of a house, are limited. In this study, these new economic and cultural features were included.

Therefore, in general, this study aimed to investigate the association between economic factors and contraceptive switching in Indonesia. Specifically, the objectives of the study were (i) to evaluate the patterns and differentials in the contraceptive switching by economic, demographic, and sociocultural factors, and (ii) to assess the nexus between economic characteristics and contraceptive switching after controlling for demographic and sociocultural factors.

## 2. Methods

This study employed data from the results of the 2017 Indonesia Demographic and Health Survey (DHS). This survey was carried out by Statistics Indonesia (Badan Pusat Statistik/BPS) in partnership with the National Population and Family Planning Board (Badan Kependudukan dan Keluarga Berencana Nasional/BKKBN), and the Ministry of Health of the Republic of Indonesia. The survey was implemented from July 24<sup>th</sup> – September 30<sup>th</sup>, 2017.

The unit of analysis consisted of contraceptive use from 3-62 months among women at the age 15-49. The dependent variable was the duration of the risk period up to the incidence of the contraceptive switching. According to the report of the results of the Indonesia DHS 2017 (BKKBN et al. 2018), "A woman is considered to have switched to another method if she used a different contraceptive in the month following discontinuation or if she "wanted a more effective method" as the reason for discontinuation and started another contraceptive within 2 months of discontinuation."

The main independent variables were economic factors which were the ownership of a cellular phone, bank account ownership, internet use, working status, and household wealth quintile. Meanwhile, control variables consisted of demographic and sociocultural factors. Demographic factors included a change of contraceptive, contraceptive intent, number of living children when switched and age when switched. Sociocultural factors covered education, place of residence, media exposure to family planning messages through the internet, control over own earnings, earnings magnitude relative to those of the husband's and house ownership.

Data in the study were analyzed employing univariate, bivariate and multivariate analyses. Percentage distribution of contraceptive use episodes were provided for univariate analysis. The patterns and differentials of contraceptive switching were given for bivariate analysis. A Gompertz proportional hazards model (Kleinbaum and Klein 2005) was examined to study the nexus between economic factors and contraceptive switching after controlling for demographic and sociocultural factors. The data were processed using STATA 15.

### 3. Results

#### *Characteristics of Women*

The results in the distribution of contraceptive from 3-62 months are analyzed based on economic, demographic, and sociocultural factors and are presented in Table 1. It can be seen that, according to the economic factors, the use of the majority of these contraceptives tend to happen in women who had a cellular telephone, did not own a bank account, never used the internet in the last year, were currently employed and came from households with middle wealth quintile. By demographic factors, the majority of contraceptives use belonged to those who used the injectables, intended to give births, had two or three children, and were aged 35-49 years. Based on sociocultural factors, the majority of contraceptives were used among women who had primary education, lived in rural areas, were not exposed to family planning or internet, did not have earnings or whose husbands had no earnings and did not own a house.

#### *Differentials in Contraceptive Switching*

The results of bivariate analysis show that around 13 in 100 contraceptive use episodes were switched within 12 months (Table 1). The 12-month contraceptive switching rate varied by economic, demographic, and sociocultural factors. It was higher among women who had a cellular phone, owned a bank account, ever used the internet in the last year, were currently employed and came from households in the highest wealth quintile. Moreover, the contraceptive switching rate was higher among women who switched the pills, intended to limit births, had two or three children, were aged 25-34 years, had higher education, lived in urban areas, read about family planning from the internet in the last 6 months, did not have control over their earnings (the husband decided how the wife's earnings were used), earned more than her husband, and owned a house jointly with someone else.

#### *Effects of Economic Factors on Contraceptive Switching*

The results of multivariate analysis of the nexus between economic features and contraceptive switching controlling for demographic and sociocultural factors were given in Table 2. The above mentioned factors were significantly associated with contraceptive switching risk statistically at 0.05 significance level. In addition, the demographic and sociocultural factors affected the risk of contraceptive switching significantly and statistically at 0.05 significance level, except the place of residence. Furthermore, the shape parameter, Gamma, was negative (-0.026), indicating a declining hazard of switching contraception over time.

The results of the study found that women who owned a cellular phone had a 1.2 times higher risk of switching contraception. In addition, owning a bank account was associated with 1.1 times higher risk of switching contraception in comparison to women than did not own a bank account. Moreover, women who came from households in the second, middle, and highest wealth quintile had a 1.1, 1.2, and 1.3

times higher risk of switching contraception compared to women who came from households in the lowest wealth quintile.

By demographic factors, the hazard of switching contraception were, respectively, 0.15, 0.58, 0.29, 0.39, and 0.26 times lower among IUD, injectables, implants, male condom, and traditional methods users than the risk of switching contraception among pill users. Meanwhile, women intended to limit births had 1.13 times higher risk of contraceptive switching than women who wanted to space births. Women who had two or three children had 1.18 higher hazard of switching contraception than women who had no children or one child and women who were aged between 25-34 years and 35-49 years had respectively, 0.62 and 0.38 lower risk of switching contraception than women who were aged 15-24 years.

Variables	Percentage	Contraceptive switching rate
<b>Economic factors</b>		
<b>Have a cellular phone</b>		
No	21.2	10.86
Yes	78.8	13.52
<b>Have a bank account</b>		
No	62.8	12.19
Yes	37.2	14.28
<b>Use the internet in the last year</b>		
Never	57.2	12.05
Ever	42.8	14.12
<b>Working status</b>		
Currently not employed	47.9	11.01
Currently employed	52.1	14.85
<b>Wealth quintile</b>		
Lowest	17.0	11.07
Secondary	20.8	12.73
Middle Income	21.9	13.30
High middle income	20.8	10.70
Highest	19.4	17.02
<b>Demographic factors</b>		
<b>Method</b>		
Pill	21.3	20.82
IUD	6.6	5.40
Injectables	50.7	12.74
Implants	8.2	3.16
Male condom	4.2	10.74
Traditional	9.0	7.17

<b>Contraceptive intent</b>		
Spacing	53.9	11.80
Limiting	46.1	14.70
<b>Number of living children when switched</b>		
0-1	32.1	11.40
2-3	59.2	14.79
4+	8.7	8.42
<b>Age</b>		
15-24	16.1	13.37
25-34	41.9	13.89
35-49	42.0	11.74
<b>Sociocultural factors</b>		
<b>Education</b>		
No education	7.5	12.88
Primary	51.2	11.14
Secondary	28.7	13.98
Higher	12.7	17.77
<b>Place of residence</b>		
Rural	52.0	12.45
Urban	48.0	13.55
<b>Read about family planning from the internet in the last 6 months</b>		
No	79.1	12.19
Yes	20.9	15.75
<b>Person who decides how the wife's earnings are used</b>		
Alone	32.2	14.24
Husband	1.6	25.85
Other (Did not have cash earnings)	66.2	12.09
<b>Wife's earnings compared to husband's earnings</b>		
More	8.1	17.31
Less	28.3	14.59
About the same	7.4	15.97
Other (Did not receive cash earnings or husband had no earnings)	56.1	11.19
<b>Own a house</b>		
Did not own	39.5	12.14
Alone	20.5	12.10
Jointly with someone else	38.4	14.69
Alone and jointly with someone else	1.6	5.92
<b>Total</b>	100.0	12.98

Table 1. Distribution of contraceptive use episodes and 12-month contraceptive

switching rate by economic, demographic, and sociocultural characteristics of women, Indonesia Demographic and Health Survey 2017 ( $n = 18,706$ )

By sociocultural factors, the risk of switching contraception was 1.15 and 1.52 times higher among women who had secondary education and higher education, respectively, in comparison to women who had no education. This risk was 1.17 times higher among women who read about family planning from the internet in the last 6 months.

Variables	Hazard Ratio	p-value	[95% Conf. Interval]	
<b>Economic factors</b>				
<b>Have a cellular phone (Ref: No)</b>				
Yes	1.177	0.000	1.080	1.283
<b>Have a bank account (Ref: No)</b>				
Yes	1.094	0.010	1.022	1.172
<b>Usage of internet in the last year (Ref: No)</b>				
The internet use	0.956	0.283	0.881	1.038
<b>Working status (Ref: Currently not employed)</b>				
Currently not employed	1.083	0.059	0.997	1.176
<b>Wealth quintile (Ref: Lowest)</b>				
Second	1.124	0.025	1.015	1.245
Middle Income	1.185	0.001	1.069	1.315
High middle Income	1.004	0.939	0.896	1.126
Highest	1.260	0.000	1.112	1.427
<b>Demographic factors</b>				
<b>Method (Ref: Pill)</b>				
IUD	0.145	0.000	0.120	0.175
Injectables	0.580	0.000	0.543	0.619
Implants	0.286	0.000	0.247	0.330
Male condom	0.392	0.000	0.332	0.463
Traditional	0.262	0.000	0.227	0.302
<b>Contraceptive intent (Ref: Spacing)</b>				
Limiting	1.134	0.001	1.054	1.221
<b>Number of living children when switched (Ref: 0-1)</b>				
2-3	1.179	0.000	1.079	1.288
4+	1.042	0.595	0.895	1.213
<b>Age (Ref: 15-24)</b>				
25-34	0.618	0.000	0.565	0.676
35-49	0.375	0.000	0.336	0.419
<b>Sociocultural factors</b>				

<b>Education (Ref: No education)</b>				
Primary	0.920	0.183	0.814	1.040
Secondary	1.151	0.040	1.007	1.316
Higher	1.520	0.000	1.302	1.776
<b>Place of residence (Ref: Rural)</b>				
Urban	1.063	0.065	0.996	1.135
<b>Read about family planning from the internet in the last 6 months (Ref: No)</b>				
Yes	1.169	0.000	1.077	1.269
<b>Person who decides how the wife's cash earnings are used (Ref: Alone)</b>				
Husband	1.720	0.000	1.405	2.105
Other	1.059	0.260	0.959	1.169
<b>Wife's cash earnings compared with husband's cash (Ref: More)</b>				
Less	0.908	0.076	0.817	1.010
About the same	0.915	0.207	0.797	1.050
Other	0.837	0.011	0.729	0.960
<b>Own a house (Ref: Did not own)</b>				
Alone	0.984	0.800	0.866	1.117
Jointly with someone else	1.148	0.013	1.029	1.282
Alone and jointly with someone else	0.637	0.004	0.469	0.867
<b>Constant</b>	0.034	0.000	0.028	0.042
Gamma	-0.026	0.000	-0.029	-0.024

Table 2. Hazard ratio, *p*-value, and 95% confidential interval of contraceptive switching by caharacteristics of women based on Gompertz hazard mode: Indonesia Demographic and Health Survey 2017

#### 4. Discussion

The results of this study support the findings from the previous studies on the nexus between economic features and contraceptive switching (Curtis and Blanc 1997, Arifin, 2003; Wang and Hong 2017; Samosir et al. 2020; Rahmawati and Samosir 2022). Higher risk of contraceptive switching among relatively better-off women in Indonesia indicates better economic ability to access family planning information, services, and methods in order to switch to more suitable and effective methods. The importance of demographic and sociocultural factors on contraceptive switching were also found in the previous studies (Curtis and Blanc 1997, Arifin, 2003; Wang and Hong 2017; Samosir et al. 2020; Rahmawati and Samosir 2022). Higher risk of switching the pills suggests that this method was mainly used temporarily before using more effective contraceptive methods. This can be a consequence of side effects or health problems caused by pills and therefore were obliged to another method



of contraception. Meanwhile, higher risk of contraceptive switching among women who intended to limit births was not expected and might be caused by the fact that women were still in search of the most suitable contraceptive method to limit births. This is the case of women who already had two or three children, had higher risk of switching contraception and were expected to switch to more effective contraceptive methods. Lower risk of switching contraception among older women was expected as they were required to prevent unwanted pregnancies by using more effective contraceptive methods.

Meanwhile, the significance of sociocultural factors in contraceptive switching, reveals that higher education and access to family planning information through the internet also enables women to knowingly switch to the contraceptive method they want. Furthermore, women economic situation may also increase women's access to more effective and suitable contraceptive methods.

## 5. Conclusion

The results of this study show that economic factors affect contraceptive switching in Indonesia even after controlling for demographic and sociocultural factors. It implies the need to formulate and implement suitable family planning policies and strategies, in particular the provision of accessible information, education and communication activities, including social media as well as the provision of affordable family planning services for safe contraceptive switching, in order to manage contraceptive switching among the economically, socially, and culturally better-off and among demographically at risk women in order to prevent unwanted births.

## References

- Ali, M., & Cleland, J. (2010). Contraceptive Switching after Method-related Discontinuation: Levels and Differentials. *Studies in Family Planning*, 41(2), 129-133. Retrieved from <http://www.jstor.org/stable/25681353>
- Arifin, E.N. (2003). Factors associated with contraceptive discontinuation in Bali, Indonesia: a multilevel discrete-time competing risks hazard model.
- Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN), Badan Pusat Statistik, Kementerian Kesehatan, USAID. (2018). *Survei Demografi dan Kesehatan Indonesia 2017*. Jakarta, Indonesia: BKKBN, BPS, Kemenkes, USAID.
- Barden-O'Fallon, Janine, Speizer, Ilene S., Lisa M. Calhoun, Lisa M., and Corroon, Meghan., (2018). Women's contraceptive discontinuation and switching behavior in urban Senegal, 2010–2015, Barden-O'Fallon et al. *BMC Women's Health*. <https://doi.org/10.1186/s12905-018-0529-9>
- Bradley, S., Schwandt, H., and S. Khan. (2009). Levels, trends and reasons for contraceptive discontinuation, DHS Analytical Studies 20, Calverton, MD, USA: ICF Macro.
- Bradley, Sarah E.K., Hilary M. Schwandt, Hilary M., Khan, Shane. (2009). Levels, Trends, and Reasons for Contraceptive Discontinuation, DHS Analytical Studies No. 20, ICF Macro. <https://www.gatesfoundation.org/What-We-Do/Global-Development/How-have-contraceptives-changed-your-life>

- Bradley, S., Croft, T., and Rutstein, S. (2011). The impact of contraceptive failure on unintended births and induced abortions: estimates and strategies for reduction DHS Analytical Studies 22, Calverton, MD, USA: ICF Macro.
- Castle, S. and Askew, I. (2015). Contraceptive Discontinuation: Reasons, Challenges, and Solutions. Population Council.
- Croft, Trevor N., Aileen M. J. Marshall, Courtney K. Allen, et al. (2018). Guide to DHS Statistics. Rockville, Maryland, USA: ICF.
- Curtis, S. L. and Blanc. A.K. (1997). Determinants of contraceptive failure, switching, and discontinuation: An analysis of DHS contraceptive histories. DHS Analytical Reports No. 6. Calverton, Maryland: Macro International Inc.
- Grady, William R., John O. G. Billy, and Daniel H. Klepinger. (2002). Contraceptive Method Switching in the United States, Perspectives on Sexual and Reproductive Health, 2002, 34(3):135-145.
- Hamill, D., Tsui, A., and Thapa, S. (1990). Determinants of Contraceptive Switching Behavior in Rural Sri Lanka. Demography, 27(4), 559-578. Retrieved from [www.jstor.org/stable/2061570](http://www.jstor.org/stable/2061570).
- Kleinbaum, David G. and Klein, Mitchel. (2005). Survival Analysis A Self-Learning Text, 2nd ed. Springer.
- National Population and Family Planning Board (BKKBN), Statistics Indonesia (BPS), Ministry of Health (Kemenkes), and ICF. (2018). Indonesia Demographic and Health Survey 2017. Jakarta, Indonesia: BKKBN, BPS, Kemenkes, and ICF.
- Rachmawati, A.R. and Samosir, O.B. (2022). The Role of Quality Family Planning Services in Contraceptive Switching to Long-Acting and Permanent Methods (LAPM). Proceedings of the International Conference on Industrial Engineering and Operations Management Nsukka, Nigeria, 5 - 7 April, 2022
- Samosir, O.B. (1994). Contraceptive Use in Indonesia. Doctoral dissertation (not published). Department of Social Statistics, University of Southampton, United Kingdom.
- Samosir, O. B. (1997). Analysis of contraceptive switching in Indonesia, Journal of Population, pp. 97-118.
- Samosir, O.B., Kiting, A.S., and Aninditya, F. (2020). Role of Information and Communication Technology and Women's Empowerment in Contraceptive Discontinuation in Indonesia, Journal of Preventive Medicine and Public Health. 53:117-125, <https://doi.org/10.3961/jpmph.19.300>
- Sian L. Curtis, Sian L., Dan Blanc, Ann K. (1997). Determinants of Contraceptive, Failure, Switching, and Discontinuation: An Analysis of DHS Contraceptive Histories. Macro International Inc. Calverton, Maryland, USA.
- Simmons, R.G., Sanders J.N., Geist G., et al. (2019). Predictors of contraceptive switching and discontinuation within the first 6 months of use among Highly Effective Reversible Contraceptive Initiative Salt Lake study participants. Am J Obstet Gynecol; 220:376.e1-12.
- Wang, Wenjuan, and Rathavuth Hong. (2017). Contraceptive Discontinuation, Failure, and Switching in Cambodia. Further Analysis of the 2014 Cambodia Demographic and Health Survey. DHS Further Analysis Reports No. 105. Rockville, Maryland, USA: ICF.