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Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi dan Pembangunan, 20 (1), 2019, 130-140

Determinants of Demand for Higher Education in Indonesia: Evidence from Indonesia Family Life Survey

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Recieved: August 2018 | Revised March 2019 | Accepted April 2019

Abstract

One of the most remarkable events in recent epoch has been the continuous increase in the proportion of students entering higher-level education. As such, it seems reasonable to assume to what extent the significant rise in higher-level education participation has a connection to the individual characteristics, social-economic, religion, gender, ethnicity and geography variables, as observed in the literature. Using data from the Indonesia Family Life Survey (IFLS) a binomial logit model was fitted to control and verify the factors that influence an individual to pursue higher-level education in Indonesia. Firstly, model outcomes indicate for individual characteristic; score, school type are core important variables for individual participation in higher education in Indonesia. Secondly, for the socioeconomic variables; income, father's education, mother's education, household status, household size are essential variables for an individual participation in higher education. However, on the gender, ethnicity variables; a javanese, male individual signals less likely to demand higher education in Indonesia. Finally, regional and geographic variables are not significant in deciding an individual participation in higher-level education in Indonesia.

Keywords: Higher education, determinants, Indonesia, IFLS
JEL Classification: I25

How to Cite: Rifa'i, A., Irwandi, I., & Mendy, D. (2019). Determinants of Demand for Higher Education in Indonesia: Evidence from Indonesia Family Life Survey. Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi dan Pembangunan, 20(1). doi:https://doi.org/10.23917/jep.v20i1.6701

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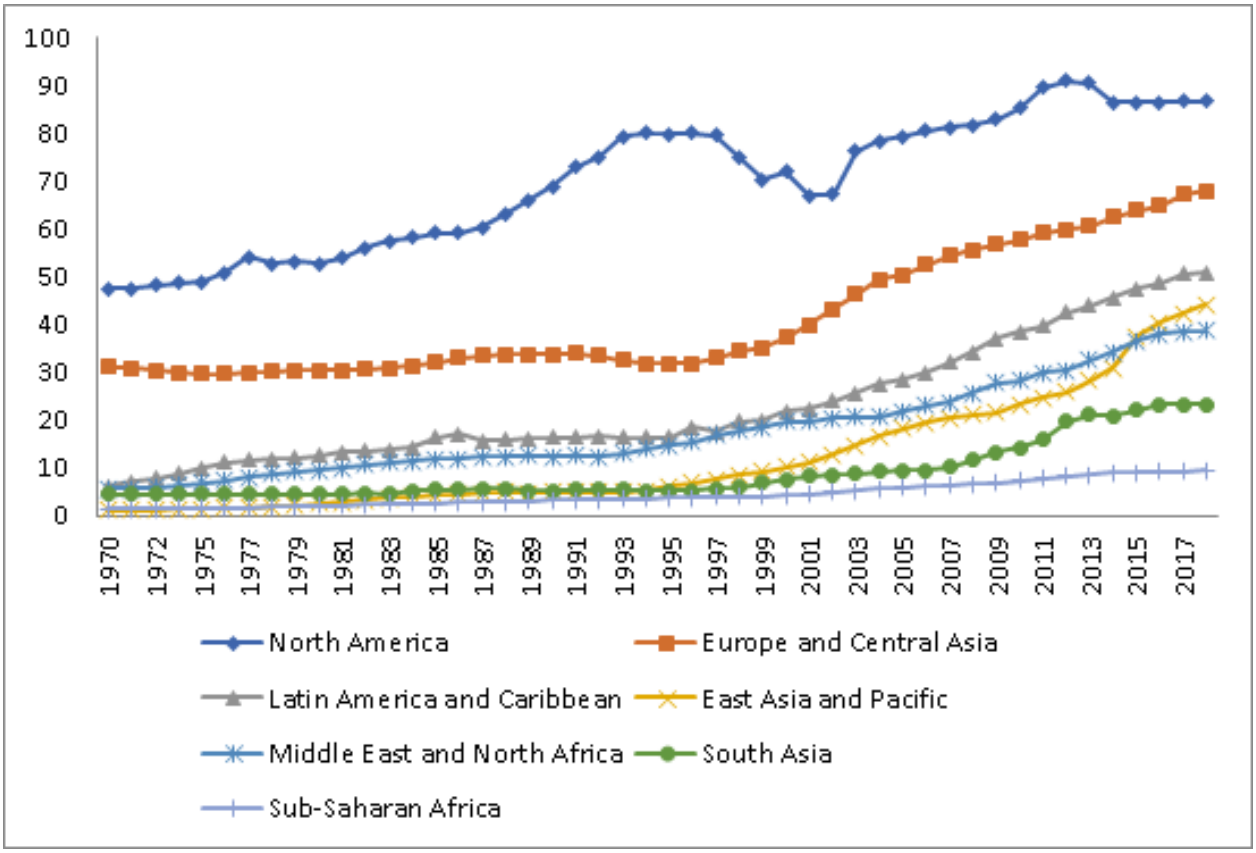
1. Introduction

In the dynamic global scenario higher education participation plays a vital role in promoting economic growth. As such, a striking feature of growth recorded in developing countries is that most of the consistently fast-growing countries have also shown a remarkable higher literacy ratio (Chakrabarti, 2010). Accordingly, during the last quarter of the twentieth century, the process of transition to a "knowledge society" has begun in the developed countries and similar yet a sluggish pattern in developing countries, therefore resulting in the formation of a new global structure called "knowledge economy". In this modern structure, the economic power, knowledge, and learning levels of the individuals and the competitiveness of the countries are often gauged by the human and social capital. This process has increased expectations from the universities responsible for the production and sharing of knowledge and has become a focus of attention for higher education societies. However, Callender and Dougherty (2018) argued that the social and economic conditions of a household greatly influence the ability to continue education at a higher level. In the other hand, Gushchina (2017) explained that market of educational services, lack of connection between labor

market, reduction of intellectual potential of the youth, decline in the quality of higher education in country, and issues in commercialization of higher education plays an important role in household decisions to continue their education to a higher level. As a result, the regions of the world account for a different proportion, in the global number of higher education participation.

The rise in higher education participation has become interestingly diversified over the last quarter of the century. Figure 1 portrays the participation of higher education by regions around the globe. North America hosted over (80.03 percent) higher education participation worldwide in 2014, Europe and Central Asian hosted over (60.07 percent), Latin America and the Caribbean hosted the third largest number of higher education participation (43.3 percent), followed by East Asia & Pacific (36.4 percent), Middle East and North Africa (36.42 percent), South Asia (20.84 percent) and finally sub-Saharan Africa (8.5 percent) in 2014.

In light of the above, ultimately the demand for higher education has increased rapidly all over the world (Barro & Lee, 2013). In the same fashion, according to the reports of international organisations such as the World Bank, United Nation, UNESCO and the organisation for the Economic Co-operation and Development (OECD) the number of students receiving higher education in the world is increasing rapidly (Bülbül, 2017). Yet, regions such as Africa and Asia still remain under other regions, particularly in America. This becomes global challenge to continue to make higher education more inclusive so that human development will be more evenly distributed and have implications for increasing productivity and economic growth globally.



Source: World Bank Indicators

Figure 1. Gross Enrolment Ratio in Tertiary Education by Region

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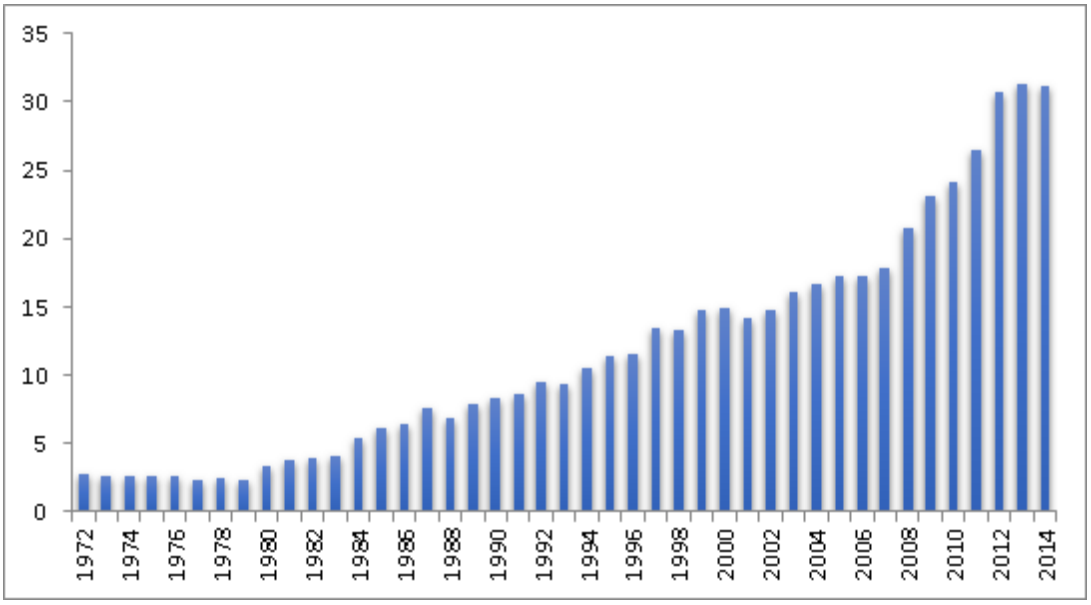
1.1 Background on Higher Education in Indonesia and Recent Development

Table 1. Distribution of Higher Education Providers in 2013

	University	Institutions	College	Polytechnic	Academy	Total
Public	55	8	2	33		**98**
Private	440	52	1463	158	1240	**3335**
Islamic	52					**52**
Open University	1					**1**
Total	**546**	**60**	**1465**	**191**	**1240**	**3502**

Source: Moeliodihardjo (2015)



Source: Authors graphical representation using World Bank Indicators

Figure 2. Gross Enrolment Ratio in Tertiary Education in Indonesia

The Indonesian higher education system referrers to all post-secondary education, comprising of vocational, academic, and professional education, polytechnic, college and academy (Moeliodihardjo, 2015). In historical context, in the 70s the old Dutch system was adopted then of late, in some areas such as medical and vocational education the continental European model was adopted. Importantly, a higher education program in Indonesia is offered by five institutions namely: (academy, polytechnic, college, institute and university). The first two (academy, polytechnic) specialise in vocational education stream, while the last three are more comprehensive and allowed to offer all educational streams. A college (Sekolah Tinggi) is a specialised institution focusing on one particular academic discipline. Unlike universities, institutions are specialised in a particular group of subjects such as science and technology, art or agriculture (Moeliodihardjo, 2015). The private sector mostly offers universities in Indonesia. More to the point, out of around 3500 institutions, only approximately 150 institutions are public (established and operated by the government). The public institutions are mostly under the MoEC (98 institutions) and MoRA (53 institutions). Of late, the government has established some new

public institutions by converting the statue of existing private institutions. Table 1 displays the distribution of higher education providers in Indonesia.

Moreover, Figure 2 shows the changing higher-level education participation in Indonesia between (1970 to 2014). Initially, it shows that higher-level education participation has been decreasing rapidly for some years during the 1970s, but rise rapidly in 1980, and rising by nearly above 30 percent in 2014.

Against the background, these observations give rise to the following conundrum; "what are the determinants of higher-level education participation in Indonesia?". On the foundation of answers to such conundrum, this paper formulated a binomial logit model that examine the factors that influence higher education participation in Indonesia utilising the Indonesia Family Life Survey (IFLS) perhaps with the view of providing insight to the recent rise in higher education participation in Indonesia.

1.2 The Literature Review

The literature emphasised that higher-education may have direct effects on the economic prospects of countries (Bloom, Canning, & Chan, 2005). Moreover, many observers have emphasised the crucial importance of human capital, mainly as attained through education, to economic progress. The desire for a highly educated population stems from the belief that education can help economic growth buy influencing worker productivity, as an abundance of well-educated people goes along with a high level of labour productivity (Mankiw, Romer, & Weill, 1992) Romer, and Weil (1992. It also implies a more significant number of more skilled workers and a greater ability to absorb advanced technology from developed countries. The level and distribution of educational attainment also have an impact on social outcomes, such as child mortality, fertility, education of children and income distribution (Barro & Lee, 1994; De Gregorio 2002"mendeley":{"formattedCitation":"(De Gregorio, 2002; Breierova & Duflo 2004). As a result, encouraging third level education participation has now become an essential policy objective for most government around the world (Bülbül, 2017).

The higher level education-going decision has attracted considerable research attention (Bishop, 1977; Fuller, Manski, & Wise, 1982). As such, much theoretical and empirical work, carried out globally has attempted to understand the type of factors that may impact on a young person making the transition from the secondary level education to a third level institution (Flannery & O'Donoghue, 2009). Some of these studies highlight the role of the benefits and cost associated with third level education or not. The benefits are seen as the potential extra lifetime earnings from higher education while the costs are both direct and indirect. On the one hand, the direct cost includes tuition fees, while on the other hand, the main indirect cost looked at is the foregone earnings individual experience while in higher education. Furthermore, higher education participation has been widely studied in economics literature from several viewpoints. In economics and other social sciences, various theories have been put forward to explain the demand for education, and mostly concentrating on the following notions; cost, available income, future earnings expectations, unemployment, psychological analysis, space analysis, and model of personal characteristic (Mora, 1997).

In practice, earnings and job perspective probably determine the demand for education. Psychologist on the contrary support the importance of personal test and ability as the true determinants of education choice. The educational choice models of economics and psychologist they are conceptually related; given group alternative, an individual will choose the alternative that provides greater utility. On the other hand, sociologist mainly concentrates on the social background as the key determinants of education choice. For example, the personal characteristic of the individual makes it possible to analyse the problem of equity of access for individual coming from different social strata.

Most analyses of this type in economics literature (Radner & Miller, 1970; Bishop 1977) have shown the significance of individual characteristics, such as intelligence or academic performance, to predict the access to higher education participation (Mora, 1997). Again, total expenditure in education has an initial component of direct cost regarding; registration fees, textbooks, transport cost and in such case, maintenance and accommodation, but there is also an opportunity cost (income lost) that should be considered. More so, to opt for a four-year university degree implies bearing an additional total expenditure on education. Also, it is assumed that scholarship increase the desire to demand a higher quality of education. For example, and if all other factors remain constant and individual is more likely to study a four-year university degree if she/he has a grant than without a grand (De, Jiménez, & Salas-Velasco, 2000).

On the sociological perspective, the influence of the family background has been widely discussed as a potential variable to affect the demand for higher education (Blau & Duncan, 1967). The strong influence of family background has repeatedly been reported in research, but how the educational background of a parent affects the educational attainment of children is rather a complex issue (Mora, 1997). Hopkins (1974) confirms that the average educational level of a Student whose parent has a higher level of education are more likely to finish the education level (longer-duration university studies). In this fashion, human capital transfer between parent and children have a decisive influence on the choice of the student (Cea & Mora, 1992). Likewise, the main breadwinner's occupation, or social class of which he/she belongs, is usually of great importance in an individual's decision to access a specific profile of university degree (De et al., 2000). In their theories, the educational and professional level of parents, along with the family economic situation, affect the educational careers of their offspring. Parent with higher socioeconomic status have children that pursue higher levels of education. Other factors such as environment and household income is also analysed as possible influences on higher education (Flannery & O'Donoghue, 2009), and factors such as; gender, and place of residence, higher school classroom performance (grades) and the score achieved on the entrance college examination (Hansen, Saleh, Flinn, & Hotchkiss, 1989). Additionally, transportation spatial distance and education facilities also play a role in the decision to participate in education, including transportation costs and possible extra living cost (James, 2001; Frenette, 2006).

The proximity of higher education institution is also a relevant factor for higher level education participation (Mora, 1997). There are rare studies to investigate the role of the information and communication technology (ICT) on higher education demand. However, Black, Devereux, and Salvanes (2005) argue that ICT can improve learning effectiveness by the use of different methods of teaching and learning from those used in traditional education. Better learning performance and thus greater probability to get included or to remain in education process for those using modern ICT has been proved by (Lindroth & Bergquist, 2010).

3. Research Methodology

3.1 Logit Model

As already mentioned, the core intention of the study is to model the probability that an individual chose to participate in higher education: i.e. the probability that an individual decides to continue beyond the upper secondary level of education. Thus, the research used descriptive with quantitative approach. A such, the binary model is fitted to the sample data to estimate the effect of the independent variables describes in individual demand for higher education. Following (Greene, 2008), the representation of the binary logit model is given in Eq(2). Hence, if dependent variable Y, the response is either to attend higher education or not to attend). Here, the independent variables that are expected to

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explain the individual's decision is captured in a vector . The probability that the dependent variable Y takes either value is therefore represented algebraically in symbol as:

$$Prob\left(Y_I = {}^{1}/_{x_{ij}}\right) = F(x_{ij}\beta_j)\text{c}$$
$$Prob\left(Y_I = {}^{0}/_{x_{ij}}\right) = 1 - F(x_{ij}\beta_j) \quad (1)$$

For individual

The probability that individual continues to higher education in a given model is a function of the vector and a set of parameters that reflects the impact of a change in the dependent variable on the probability that). The logistic distribution for the cumulative distribution function in symbol is represented.

as: $Prob\left(y_i = \frac{1}{x_{ij}}\right) = F\left(x_{ij}\beta_j\right) = \frac{e^{x_{ij}\beta_j\varepsilon_{ij}}}{1+e^{x_{ij}\beta_j\varepsilon_{ij}}}$

which is a binomial with a stochastic error term. Finally, the log-likehood function is represented in symbol as:

$$lnL_j = \sum_{y_i=1}^{n} lnF(x_{ij}^{i}, \beta_j) + \sum_{y_i=0}^{n} ln1 - F(x_{ij}^{i}, \beta_j) \quad (2)$$

3.2 Data

This study used the latest (2014) database of the Indonesia Family Life Survey (IFLS) which provides detailed information on almost all aspects of the Indonesian domestic life both at (the households and community level), and (Table 2) reports a summary of the descriptive statistics for the respective variables of interest.

In general, the number of samples is in the range of 2329, while the variables Score and Income are 1004 and 2327 respectively. The difference in the number of samples is one of the normal things that happens when using IFLS data, especially this happens during the data cleaning process. However, the overall number of samples provides more accurate results, especially in the estimation process. this is the main advantage of IFLS data that is able to cover massive data from the field.

Table 2. Summary of the Descriptive Statistics

Variable	Sample (n)	Mean	Std. Dev
Dependent variable			
Higher education = (1)	2329	0.205	0.404
Control variables			
Prior education and Attainment			
Score	1004	34.124	12.454
Scholarship = (1)	2329	0.052	0.221
School type = (1)	2329	0.509	0.500
Socio-Economic Status			
Income	2327	16.682	1.026
Father's education	2329	9.481	4.37
Mother's education	2329	9.111	4.306
Vehicle = (1)	2329	0.853	0.354
House status = (1)	2329	0.691	0.462
Household size	2329	5.494	2.636
Handphone = (1)	2329	0.936	0.245
Religion, Gender, Ethnicity, and Geography			
Moslem = (1)	2329	0.908	0.280
Male = (1)	2329	0.457	0.498
Javanese = (1)	2329	0.377	0.485
Urban = (1)	2329	0.652	0.476

Source: Author's estimate

Hence, from Table 2 the hypothesis of the study is expressed Eq(3) and represented econometrically in Eq(4). The dependent variable namely the decision to continue higher education is a (dummy=1) if the individual pursues higher education or zero, otherwise. Drawing from the existing literature, the explanatory variables (see Table 2 for details) in broader context were designed to control for the individual achievement, social-economic, religion, gender, geographical location to which an individual belongs. These are elucidated in greater details in the following paragraphs.

$$\text{Higher education } p_i = f\begin{bmatrix}\text{Prior educational achievement}_i \\ \text{Socioeconcomic status}_i \\ \text{Religion, Gender, Ethnicity, Geography}_i\end{bmatrix} \quad (3)$$

$$\begin{aligned}\text{DHedu}_i = {} & \beta_o + \beta_1 \text{score}_i + \beta_2\, \text{scholarship}_i + \beta_3 \text{school\_type}_i + \beta_4 \text{income}_i \\ & + \beta_5 \text{father's\_education}_i + \beta_6 \text{mother's\_education}_i + \beta_7 \text{Dhouse\_status}_i \\ & + \beta_8 \text{houshold\_size}_i + \beta_9 \text{handphone}_i + \beta_{10} \text{Dmuslim}_i + \beta_{10} \text{Dmale}_i \\ & + \beta_{11} \text{DJavanese}_i + \beta_{11} \text{Durban}_i + e_t\end{aligned} \quad (4)$$

3.2.1 Explanatory Variables

3.2.1.1 Individual achievement

The variables in the first category are essential, and it can be thought as in some way measuring the ability or overall productivity of the individuals, therefore influencing future returns on investment in human capital as well the probability of study success. The scholarship is a (dummy=1) if the individual obtained a scholarship, and zero otherwise. And school type is a (dummy=1) if the individual attends a public senior high school and zero otherwise.

3.2.1.2 Socio-economic variables

The second category focused on the socio-economic variables. These include the household's level of income. These variables are chosen to reflect family wealth in the literature since wealth is a significant explanatory variable to influence the demand for higher education participation. As opined by (Becker, 1964), family income may become a vital way of financing investment in higher education in the presence of imperfect capital markets. For the other variables, parent education of an individual to capture the human capital transfer between parents and individuals (Cea & Mora, 1992), here, both father's education and mother' education is proxied by their years of schooling. Vehicle proxied as a (dummy= 1) to represent an individual has a vehicle and zero otherwise. House status is dummy implying one if the individual owns a house, and zero otherwise. Finally, handphone is a dummy 1 if the individual has a phone and zero otherwise.

3.2.1.3 Religion, Gender, Ethnicity and Geography

The remaining category namely; religion, gender, ethnicity and geography are generated variables. For instance, Muslim is a (dummy=1) if the individual is Muslim and zero otherwise. The variable male is a (dummy=1) if the individual is a male, and zero otherwise. Similarly, Javanese is a (dummy=1) if the individual is a Javanese and zero otherwise. Finally, urban is (dummy=1) if the individual leave in the urban area, and zero otherwise.

4. Analysis and Discussion

The results obtained from the binomial logit empirical model is quantified. Hence, the maximum likelihood estimates of the binary logit model of higher education participation in Indonesia is reported in Table 3. Here, the primary focus is devoted to only those variables that are statistically significant.

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Table 3. Binomial-Logit Model of Higher Education Participation in Indonesia

Variable	Coefficient	Standard Errors	Marginal effect
Prior education and Attainment			
Score	0.024***	0.006	0.004
Scholarship	0.535	0.486	0.090
Scholar type	0.361**	0.156	0.061
Socio-Economic Status			
Income	0.264***	0.089	0.045
Father's education	0.124***	0.026	0.021
Mother's education	0.130***	0.028	0.024
Divorce	-0.574	1.139	-0.094
Vehicle	0.214	0.252	0.036
House status	1.117***	0.190	0.189
Household size	0.151***	0.036	0.026
Handphone	0.481	0.461	0.081
Religion, Gender, Ethnicity, and Geography			
Muslim	-0.162	0.261	-0.027
Male	-0.327**	0.150	-0.055
Javanese	-0.299***	0.164	-0.051
Urban	-0.137	0.178	-0.023
-2logL		-512.534	
		0.200	

Note: (i) *** P<0.01 implies rejection at 1 percent, (ii) ** P<0.05 denotes rejection at 5 percent, (iii) *P<0.1 denotes rejection at 10 percent, (iv) the binomial logit model is estimated using the maximum likelihood.

Firstly, in Table 3, the results indicate a pivotal role of the exam score in determining the demand for higher education given that one takes an exam. The score which quantifies the individual ability would increase the individual's probability by 0.4 percent of making a transition from high secondary education to a higher education institution. The results support the economic theory and is consistent with the finding of Hansen et al. (1989) that exam score is a crucial determinant of higher education participation in Indonesia. Moreover, of interest in that category is the school type of the individual, indicates a positive and statistically significant effect on the demand for higher education. Also, the odds of the individual from a public school is 6.1 percent more likely to proceed to a higher institution that an individual from a private school. However, scholarship although positive indicates an insignificant effect on higher education participation.

The second category in Table 3 comprises of socio-economic variables. Firstly, among the social-economic variables, income vehemently increases one's chance of making the transition to higher education in Indonesia, thus lends to the support of the human capital framework. Secondly, turning to the other covariates of the model the parental education level indicates that individuals with parents with a higher education level will have a higher probability of participating in the higher education. The results validate that an educated parent would seem to focus on an individual's preferences upon education. The result is consistent with much of the findings of the sociological literature (Dryler,

1998). The odd for father' and mother' education is 2.1 percent and 2.3 percent respectively. This result does not indicate that mother's education is a more of important as compared to father's education but the result signals that is a vital variable to take note off. Thirdly, household status also influences the probability that an individual demand higher education and this effect is positive and statistically significant. The results signals household with greater number of children have a significant higher likelihood of sending their children to a higher education institution. Finally, handphone is not significant in deciding an individual higher-level education participation in Indonesia.

The final category in Table 3 comprises of religion, gender, ethnicity, and geography variables. Firstly, contradictory to the existing literature, the result signals that male has a lower probability of attending higher education institution vis-a-vis girl. The results highlight that gender discrimination regarding educational attainment is less prevalent. Also, the odd to point out that the likelihood of belonging to the higher education for men is 5.6 percent less than that of a woman in the similar family and environmental condition. Owing to the gender variables, the results indicate the Javanese are less likely to participate in higher education vis a vis non-Javanese. From a sociological point of view, this is a remarkable fact that will have significant consequences, socially and economically in the future. However, further research is necessary to sufficiently ravel the exact reason as to why the Javanese are less likely to participate in higher education vis-a-vis non-Javanese. Finally, the location of the child decides to attend higher education was not significant. Perhaps, one possible reason is that over the past years the Indonesian government and private institution has expanded the number of the post-educational institution in Indonesia thus making it more comfortable for students to attend higher education.

5. Conclusion

This paper focused on higher-level education participation. While higher education has also increased rapidly in many countries over the past decades, we know much less about the relevant determinants of access in Indonesia. The lack of knowledge is propelled and contrast with the extensive literature on this topic in developed and developing countries. And due to the rising prevalence of higher-level education participation in Indonesia, a binomial logit model was employed to verify the factors that affect higher level education participation in Indonesia using the IFLS. Model outcomes brings a clear message that firstly, individual characteristic; score, school type are relevant variables for an individual participation in higher education. Secondly, for the socioeconomic variable; income, father's education, mother's education, household status, household size are important variables for individual participation in higher education. Finally, for the religion, gender, ethnicity, geography variables only Javanese and male are significant in explaining an individual participation in higher education. However, the results indicate that Javanese and male in Indonesia are less likely to participate in higher education. Thus, it will be important for future research to reveal the exact reason as to why Javanese are less likely to participates in higher education.

6. Reference

Barro, R. J., & Lee, J. (2013). A New Data Set of Educational Attainment in The World, 1950-2010. *NBER Working Paper 15902*.

Barro, R. J., & Lee, J. W. (1994). Sources of economic growth. *Carnegie-Rochester Confer. Series on Public Policy*, *40*, 1–46.

Becker, G. (1964). *Human Capital Theoretical Analysis with Special Reference to Education* (New York: Columbia University Press for NBER, ed.).

Bishop, J. (1977). The Effect of Public Policies on the Demand for Higher Education. *The Journal of Human Resources*, *12*(3), 285–307.

Black, S. E., Devereux, P. J., & Salvanes, K. G. (2005). Why the Apple Doesn't Fall Far: Understanding Intergenerational Transmission of Human Capital. *The American Economic Review*, *95*(1), 437–449.

Blau, P. M., & Duncan, O. D. (1967). *The American Occupational Structure*. New York: John Wiley and Sons.

Bloom, D., Canning, D., & Chan, K. (2005). Higher Education and Economic Development in Africa. *Africa Region Human Development Series*, 87.

Breierova, L., & Duflo, E. (2004). The Impact of Education on Fertility and Child Mortality: Do Fathers Really Matter Less Than Mothers? *NBER Working Paper No. 10513*. https://doi.org/10.1007/s13398-014-0173-7.2

Bülbül, T. (2017). Factors Influencing Access to Higher Education in Turkey. In *Global Voices in Higher Education*.

Callender, C., & Dougherty, K. (2018). Student choice in higher education—reducing or reproducing social inequalities? *Social Sciences*, *7*(10), 189.

Cea, F., & Mora, J. (1992). 'Análisis socioeconómico de la demanda de Estudios Superiores.' *Estadística Española*, *129*, 61–92.

Chakrabarti, A. (2010). Determinants of Participation in Higher Education and Choice of Disciplines: Evidence from Urban and Rural Indian Youth. *South Asia Economic Journal*, *10*(2), 371–402. https://doi.org/10.1177/139156140901000205

De Gregorio, J. (2002). Education and Income Inequality: New Evidence from Cross-Country Data. *Review of Income and Wealth*, *48*(3).

De, J., Jiménez, D., & Salas-Velasco, M. (2000). Modeling educational choices. A binomial logit model applied to the demand for Higher Education *. *Higher Education*, *40*, 293–311.

Dryler, H. (1998). Educational Choice in Sweden: Studies on the Importance of Gender and Social Contexts. *Swedish Institute for Social Research, Stockholm*.

Flannery, D., & O'Donoghue, C. (2009). The determinants of higher education participation in Ireland: A micro analysis. *Economic and Social Review*, *40*(1), 73–107.

Frenette, M. (2006). Too Far to Go On? Distance to School and University Participation. *Education Economics*, *1*, 31–58.

Fuller, W. C. ., Manski, C. F. ., & Wise, D. A. . (1982). New Evidence on the Economic Determinants of Postsecondary Schooling Choices. *The Journal of Human Resources*, *12*, 477–498.

Greene, W. (2008). *Econometric Analysis*. Pearson Education, USA.

Gushchina, E. (2017). Factors, criteria, and determinants of the increase in the effectiveness of university education in Russia. *International Journal of Educational Management*, *31*(4), 485–496.

Hansen, D. O. ., Saleh, A., Flinn, W. L. ., & Hotchkiss, L. (1989). Determinants of Access to Higher Education in Indonesia. *Comparative Education Review*, *33*(3), 317–333.

Hopkins, T. D. (1974). Higher Education Enrollment Demand. *Economic Inquiry*, *12*(1), 53–65.

James, R. (2001). Participation Disadvantage in Australian Higher Education: An analysis of some effects of geographical location and Socioeconomic Status. *Higher Education*, *42*(4), 455–472. https://doi.org/10.1023/a:1012264010667

Lindroth, T., & Bergquist, M. (2010). Laptopers in an educational practice: Promoting the personal learning situation. *Computers & Education*, *54*(1), 311–320.

Mankiw, N. G., Romer, D., & Weill, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, *107*(2), 407–437. https://doi.org/10.1016/j.jpolmod.2014.01.001

Moeliodihardjo, B. Y. (2015). Higher Education in Indonesia. *International Seminar on Massification of Higher Education in Large Academic Systems*. https://doi.org/10.1080/03062848608729650

Mora, J. (1997). Equity in Spanish Higher Education. *Kluwer Academic Publisher*, *33*(3), 233–249.

Radner, R., & Miller, L. S. (1970). Demand and Supply in U.S. Higher Education: A Progress Report. *The American Economic Review*, *60*(2), 326–334.