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Socioeconomic and Demographic Determinant of Fertility Rate in Eastern-Indonesia

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Abstract

Indonesia is a developing country which has intermediate fertility rate with the 237.641.326 million people in 2010 (Central Bureau of Statistic 2012) and until 2013, Indonesia is not only be the largest dan the widest country but also be a country which has the highest Total Fertility Rate (TFR) among ASEAN countries (Ministry of Health of the Republic of Indonesia 2014). One of region in Indonesia which is indicates that the fertility rate is still high enough is Eastern Indonesia. Eastern Indonesia (KTI) by Presidential Decree REPUBLIC OF INDONESIA NUMBER 55 OF 2001 comprises 14 provinces namely differences: West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Central Sulawesi, South Sulawesi, Sulawesi southeast, Gorontalo, North Maluku, Maluku, and Irian Jaya province.

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Keywords— Accreditation, Self-Evaluation, Accreditation

Introduction

Indonesia is a developing country which has intermediate fertility rate with the 237.641.326 million people in 2010 (Central Bureau of Statistic 2012) and until 2013, Indonesia is not only be the largest dan the widest country but also be a country which has the highest Total Fertility Rate (TFR) among ASEAN countries (Ministry of Health of the Republic of Indonesia 2014). One of region in Indonesia which is indicates that the fertility rate is still high enough is Eastern Indonesia. Eastern Indonesia (KTI) by Presidential Decree REPUBLIC OF INDONESIA NUMBER 55 OF 2001 comprises 14 provinces namely differences: West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Central Sulawesi, South Sulawesi, Sulawesi southeast, Gorontalo, North Maluku, Maluku, and Irian Jaya province. The province of Irian Jaya on the development, then changed its name to the province of Papua by UU No. 21, 2001 and is divided to into Papua and West Papua based on Government Regulation No. 24 of 2007 so that the Eastern Region of Indonesia consists of 15 provinces. The high fertility rate in the province of Eastern Indonesia looks on Figure 1 below.

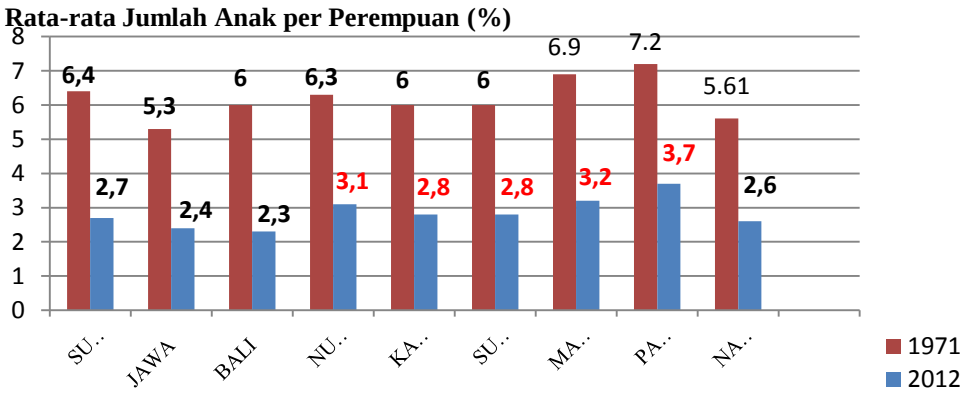

Figure 1: Fertility Rate Based On Island 1971 and 2012

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The economic, social, and areas are suspected to be the factors that affect the household fertility behavior in the provinces of Eastern Indonesia. From the fifteen provinces in Eastern Indonesia, there are only five provinces in Eastern Indonesia which has *Labor Force Participation Rate* (LFPR) above the *National Labor Force Participation Rate* (NFLPR) in 2012 (Central Bureau of Statistics 2012). In the other side, from the fifteen provinces there are still ten provinces in Eastern Indonesia which has the *Number of School Participation* (NSP) for Compulsory 9-year program (SMP) below the national rate and there are seven provinces in eastern Indonesia which has the *Number of School Participation* (NSP) for Compulsory program learning to 12 years (SMA) below the national rate (Central Bureau of Statistics 2014).

Those findings and also the geographical condition in Eastern Indonesia making the regions in the Eastern Indonesia have an underdevelopment condition. The data from The Ministry of Rural Development of Disadvantaged Regions and Transmigration (KPDTT) in 2014 said that there are 183 districts classified as disadvantaged regions with the deployment of disadvantaged areas by 70 percent or there are 128 disadvantaged areas are in eastern Indonesia . All of it is thought to influence the household conditions hereinafter also affect fertility in the provinces of Eastern Indonesia . Becker (1960:209) trying to analyze family size decisions within an economic framework as a base of neoclassical fertility theory that he build. Becker (1960:209) " classified " children as durable consumer goods (*durable goods*) and bring satisfaction or production of goods that can produce goods and services that have a similar relationship with the factors that influence the demand for durable consumer goods (*consumer durables*) and producer goods such as income and economic status of the household .

Those Becker's statement be the objectives of this research which is to investigate the effect of economic variables such as *Per Capita Consumption Expenditure* (PCE) and household economic status to the fertility in the provinces of Eastern Indonesia. On the other hand, this research also to investigate the effect of wife characteristic such as hours of work wife, wife education, and household residence to fertility in the provinces of the Eastern Indonesia. The writing of this article can be simplified as follows: The first part is an introduction that contains the background of this research , the second part discusses the previous research , the third section discusses the research methods used , while the fourth section discusses the results of the research , and the fifth part is the conclusion and implications of the results findings on policy.

Previous Research

Fertility has close links with economic factors. That is because in line with the economic development , fertility is more an economical processes than a biological processes (Mundiharno,1997:5) . Malthus could with some justification assume that fertility was determined primarily by two primitive variables, age at marriage and the frequency of coition during marriage (Becker, 1960:209). Todaro, *et al* (2013:312) Todaro , et al (2003:312) states his refusal that classical Malthusian theory of fertility too rests on economic variables that turned out to be erroneous, such as national income per capita as the main determinant of population growth. The better and valid approach in order to answer questions about population and development efforts should have prioritize to microeconomic aspects such as decision-making at the level of the family or household .

Gary S. Becker (1960 : 210) describes some of the factors that influence the demand for children such as, taste, the quality of children, income, and the supply of the children. Some economists argue that the negative relationship between quantity and quality is often observed as a consequence of the low elasticity of substitution on the household utility function between the consumption of the parents (the level of standard of living) and their children (Duesenbarry in Becker and Lewis, 1973:81). The opinion was refuted by Becker with his argument , known as a model of quality - quantity (*QQ model or Quality -Quantity model*). QQ models explaining that income showed a negative relationship with fertility . The increase in income will show a positive effect on fertility (increase the quantity) if the income effect is more dominant, in the other other hand, if the substitution effect is more dominant it will negatively affect the fertility by decreasing in the quantity and increasing the quality (Wang & Famoye 1997: 275).

On the other hand , fertility is closely related to the time value that is owned by a woman . This is explained by the theory of time allocation by Mincer in 1963 and Becker in 1965 that develops a model of domestic production. The essence of the theory of time allocation is described by Becker in case of an increase in the value of the time of a woman (wife) to encourage women (wives) tesebut to enter the labor market and spend less time for cooking , preferring ready- cooked dishes (pre -cooked foods) and prefer to spend less time to care for their infant or child by using the services of nurseries and baby-sitters (Becker , 1965 : 514).

Four fundamental determinants of fertility neo-classical theory of Becker in his various studies (1960 , 1981) are then repeated in the formulation of the research conducted by Wang and Famoye (1997) and Hondroyiannis (2004) into several variables based on four basic determinant is the consumption per capita income as a proxy of income, the economic status of the household, house of working, wife education, wife age, and residence of households. Their research showed relatively similar results where revenues negatively affect fertility or the substitution effect is greater than the income effect .

Methodology of Research

This study uses cross-section data from household surveys in Eastern Indonesia (Indonesian Family Life Survey East 2012) conducted by the RAND corporation in partnership with the SurveyMETER and National Team Acceleration and Poverty Alleviation (TNP2K), Poverty Reduction Support Facility (PRSF), and AusAID. The sample is then restricted to women who are married and aged 15-49 according to the needs of research. The economic variables used is consumption expenditure per capita as a proxy for income in Rupiah and economic status of households in the form of dummy where the value 1 is given to the non-poor households because it has a per capita expenditure of households above the poverty line and the value 0 for poor households with expenditure per capita is below the poverty line. The wife characteristic variable used is hours of work in hours unit, wife education which is converted in year unit, age of wife in year unit, and household characteristics variables such as dummy where a value of 1 for households that reside in urban areas and the value 0 for rural households.

The analytical method used is the Generalized Poisson Regression. The dependent variables were used in this study is count or discrete (count-type data). *Generalized Poisson Regression Model* (GPR) enhance the standard Poisson models and able to perform the analysis of the condition of over- dispersion and under- dispersion equally well (Wang and Famoye, 1997: 274). *Generalized Poisson Regression* models in this study was formulated as follows.

$$FERT_{\mathrm{i}} = e^{\beta 0+PCEX1 + ECOStatusX2+HOURSwifeX3 + EDUwifeX4 + AGEwifeX5 + RESIDENCEX6 +} E\mathrm{i}$$

FERT is the number of live births in a household. *PCE* is Per capita Consumption Expenditure in a household as proxy of income. *HOURSwife* is the number of working hours of wife. *AGEwife* is the wife age. *RESIDENCE* is the area where the household lives.

Empirical Result and Analysis

The result from descriptive statistic from 1.310 household shows that the average number of livebirth in rural is 3,4 and 2,5 in urban. The fertility in Eastern Indonesia shows that the average number of fertility is 3,41 with the lowest birth is 0 birth and the highest is 14 births. The lowest Per capita Consumption Expenditure as the proxy of income in the rural area is Rp. 59.229,16and the highest isRp. 7.083.528 Rupiah in urban area. The average consumption expenditure in the rural was Rp . 754 379 while in the urban of Rp . 1196103 . The average per capita consumption expenditure of households in the Eastern Region of Indonesia based on the data samples IFLS East 2012 is Rp . 871,048.2. The results of descriptive statistics from economic status variables in the province of eastern Indonesia showed that 95 percent of the sample of households in eastern Indonesia in this study is the household that has expenditure per capita above the poverty line, while only 5 percent of the samples included in households with per capita expenditure below the poverty line.

The average length of hours worked for a wife in eastern Indonesia is 27,4 hours per week or 4,6 hours per day . This suggests the possibility of a lack of effective working hours wife as a barrier household fertility. In the wife education variable, the average wife education in the rural in eastern Indonesia province is equal to elementary schools (6,4 years) and the highest education in the rural area is the equivalent of S1 (16 years old) . In the urban, the average wife education level of is a first level of high school (10,4 years), while the highest is post graduate level (18 years old). The average education of a woman (wife) in the Eastern Region of Indonesia based on the data samples IFLS East in 2012 is 7,49 or equivalent with elementary school (SD) and not pass the Junior High School (SMP). These results are expected to influence the fertility in the province of Eastern Indonesia .

The average age of a wife in eastern Indonesia, both residing in the rural area and in the urban was 34 years (still in child-bearing age). This shows that as long with age wife who are still in their productive age there is the possibility of increasing fertility rates or age wife have a positive relationship with fertility rates. From the result we also know that there are 74 percent of households in Eastern Indonesia still reside in rural areas and only about 26 percent of households living in urban areas. The results of the estimation Generalized Poisson Regression analysis on the model Socioeconomic and Demographic Factors Determinants of Fertility In Eastern Indonesia are described in the following table.

Table 1:
The Result Of *Generalized Poisson Regression* Model Analysis

Dispersion =	-0,0941568	Number of obs =	1310	
Log likelihood =	-2410,1907	LR chi2 (6) =	539,66	
		Prob > chi2 =	0,0000	

		Pseudo R2 =	0,1007	
Variabel	Coef.	Std. Error	Z	P >|z|
PCE	-2,09E-07	2,54E-08	-8,22	0 ,000
ECOStatus	-0,137223	0,0627356	-2,19	0 ,029
Hourswife	-0,0002945	0,0005726	-0,51	0 ,607
EDUwife	-0,0231286	0,003782	-6,12	0 ,000
AGE	0,0389435	0,0019231	20,25	0 ,000
RESIDENCE	-0,1071538	0,0386513	-2,77	0 ,006
_cons	0,2598407	0,0969817	2,68	0 ,007
/atanhdelta	-0,0940358	0,0206164		
Delta	-0,0937596	0,0204351		

Source: The Result of Generalized Poisson Regression Analysis

The result of *Generalized Poisson Regression* analysis to determine the effect of household consumption expenditure (PCE), household economic status, hours of work, wife education, age of the wife, and the area of the household residence on fertility in eastern Indonesia showed the following results. Per capita consumption expenditure (PCE) showed a significant negative correlation. That means that the higher the per capita household expenditure or the higher the income the lower or fewer the number of children born alive in the household, and vice versa. These results indicate that the susbtitution effectmore dominant than the income effect which also means that households in eastern Indonesia began to tend to prefer to have fewer children to increase the probability of an increase in the quality of children. This finding is in line with the results of research by Wang and Famoye (1997: 281) and also Hondroyyianis (2004: 480), which also shows the results that income will negatively affect fertility statistically.

The household economic status also showed a significant negative correlation means the there is a tendency that a non-poor family prefer to have fewer children than households with poor status (expenditure below the poverty line). These results are consistent with research conducted by Hondroyiannis (2004: 480) and then based on the results concluded that households on higher economic status tend to prefer to improve the quality of their children compared to households on lower economic status. This finding is in line with Becker (1960: 217) in his analysis that people with social and economic classes tend to have a less number of children but spend higher income for their children. That is because in the society with non-poor economic status, there are social pressures that encourage households to allocate more income to improve the quality of children.

Hours of working showed a negative relationship to fertility, which means the higher the wife working hours then fertility tends to decline, but in eastern Indonesia hours of working does not affect the number of children in the household significantly. This finding shows that the theory of time allocation applied to the neo-classical theory of fertility Becker does not apply, however Becker through his analysis had predicted it. Becker (1960: 229) states that household in the village has a number of family members larger (higher fertility rates) than urban households. That is because children born in rural areas are considered more productive as a factor of production. On the other hand, the characteristics of eastern Indonesia as part of Indonesia which are developing countries, have different characteristics and different conditions of employment of women in the urban as well as developed countries such as Michigan on research by Wang and Famoye and Greece in research that held by Hondroyiannis. The sample of this research that the majority of the households living in the village with a background of non-formal employment are expected can be influence the result of this research. This is because the average hours of working wives in eastern Indonesia only 4,6 hours per day (does not reach the normal working hours of 8 hours a day as in the formal sector).

Wife education showed a negative and significant relationship to fertility; shows that the higher the education a wife in a household or in other words, the longer a woman in a household spending time to attend the household tend to have fewer number of children. These results indicate that the higher education of a wife or the longer time spent woman (wife) to go to school the less number of children born alive in the household . These results are consistent with the results of research conducted by Wang and Famoye (1997 : 281) and Hondroyiannis (2004 : 480) states that in line with the high level of education, it shows the high value of the opportunity cost of households in the birth of a child.

Becker (1960: 216) explains that the child can not be purchased or obtained in a market, but a child born of a household. The implication of the statement is the number of children in a household is not only determined by the price of a child, but is also determined by the ability of households to bear children. The ability of households to produce children is limited to the ability of a wife who is restricted by age for childbearing women (childbearing Age) that has a time span of between 15 to 49 years. Wife of age showed a positive and significant relationship to fertility, which means increasing age (within a span of 15-49 years or childbearing Age) a woman in the household, the higher the likelihood of an increase in fertility. These results are consistent with research conducted by Wang and Famoye (1997: 281) and Hondroyiannis (2004: 480) states that in line with women of childbearing age, the chances of fertility also increased.

Residence showed a significant negative correlation , which means there is a difference between households that reside in urban and rural households which reside in the urban have the number of children born alive less than households that reside in the rural. Becker (1981 : 152) states that households who live in rural areas have higher fertility than urban households . Becker added , it is because the possibility that children in rural areas to contribute to a more productive in agriculture when they were aged 5 or 6 years . On the other hand , the "price " for having less children in rural areas , so rural families tend to pay less for each child according to Schultz in Becker (1981 : 152) so that households in the city have a negative relationship to fertility . These results are in line with the results of research and Famoye Wang (1997 : 281).

The discussion of the results of the analysis also shows that economic variables (per capita consumption expenditure) and household economic status affects fertility both partially and simultaneously while working hours wife is not significant in affecting fertility but the wife's working hours, wife education, the age of wife, and region of residence household simultaneously significant in affecting fertility in a data sample of households in the provinces of Eastern Indonesia in 2012.Based on the research that has gone through the process of analysis and discussion of them is the higher the per capita consumption expenditure (income) makes households prefer to have fewer children quantity . These results indicate that economic factors also influence fertility decline in Eastern Indonesia is based on a sample of data IFLS East 2012. The majority (95 percent) of households that are not poor economic status (per capita consumption expenditure above the poverty line) tend to have fewer number of children , This shows households with poor economic status tend to have a preference to have fewer children, but still needed more in-depth study of whether the preference of households with non-poor economic status to have fewer children due to their preference for improving the quality of children

Hours of working does not significantly affect fertility and can not be taken into consideration in the household fertility decisions . This is allegedly due to the characteristics of employment and working hours of women in developing countries (especially in rural areas) tend still a non -formal employment with low working hours (and with low wage rates anyway) so it is not strong enough to be a barrier and opportunity cost high to affect fertility behavior of households . These results also indicate the possibility that the high fertility in eastern Indonesia on data samples IFLS East 2012 may result from lower working hours of women in the province of Eastern Indonesia. The education of wife negatively affect fertility . This indicates that education can be a age-delaying marriage and fertility mechanism for household and reflects the higher opportunity cost.

The wife's age positively effect on fertility. Women's or wife in the productive age range (15-49 years) have the possibility to increase the number of children they have. Region of residence of households (74 percent of households residing in the rural area and 26 percent live in urban area) showed a negative and significant relationship to fertility. Households in rural areas tend to have more children while the number of households in urban areas tend to have fewer children. Simultaneous trials or good models test showed that the variable per capita consumption expenditure of households, household economic status, working hours, the wife of education, age of the wife, and region of residence of households affect fertility by 10 percent.

Conclusions

Based on the analysis above, it can be concluded that the economic variables such as per capita consumption expenditure of households and household economic status negatively affect fertility. Households with a per capita consumption expenditure and higher economic status above the poverty line tend to have fewer number of children. These findings are consistent with microeconomic theory of neo classical Becker fertility. On the other hand, the results of the analysis showed that the wife characteristic variable sucah as education variable negatively effect on fertility. This means that the wife with higher levels of education tend to have fewer number of children. The same effect occurs in the variable region of residence of households where the household in the rural area tend to have the number of children more than households who reside in the urban area. The age also had positive effect on fertility, while the wife working hours turned out to have no effect on fertility.

Policy Implication

The evaluation of the family planning programs need to include the economic variables and social variables such as education as one of the factors that must be considered in determining the population policy. That is very important because those two variables significantly influence fertility in eastern Indonesia.

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