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Analysis of Fiscal Policy and Fertility in Provincial Government of Indonesia

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Abstract

This research aims to analyze whether fiscal policy affects the fertility of the Provincial Government Indonesia using panel data with time series from 2007 to 2017, a cross-section of 33 Provincial governments in Indonesia. Fertility is measured using Total Fertility Rate (TFR) and Birth Rate. Local revenue, regional expenditure, and regional debt do not affect TFR but the regional deficit negatively does. Regarding the birth rate, regional income and deficits have a positive effect, regional expenditure has a negative effect, but regional debt does not affect birth rates in 33 provincial governments in Indonesia. The equivalent ricardien theory does not apply to this study because households do not assist provincial government policies caused by high fertility. As a result, national TFR is not achieved and will affect sustainable fiscal deficits.

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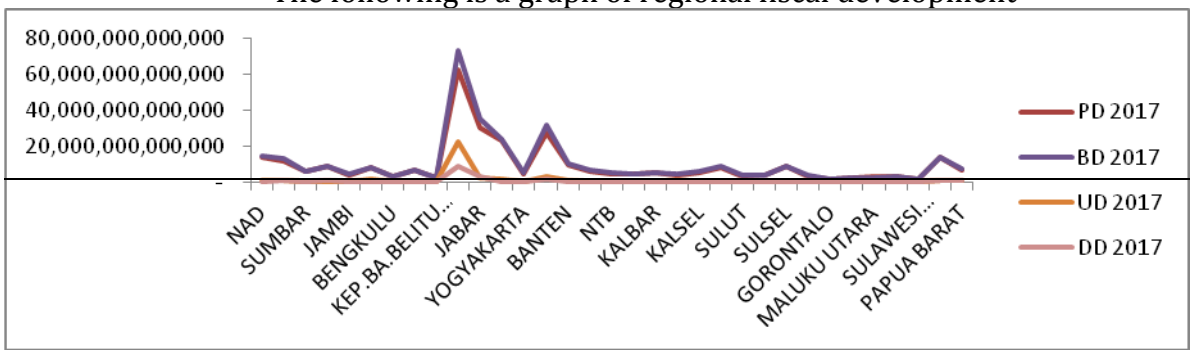
1. Introduction

Fiscal policy closely relates to taxation, because it influences the economy. If taxes are reduced, the people's purchasing power will increase and the industry can increase the product and vice versa. Meanwhile, according to the Ricardian Equivalent theory, the impact of tax reductions done by the government through tax cuts and the state budget is funded with debt, does not affect consumption because citizens think rationally. Therefore, reducing taxes does not increase consumption and investment directly. (Mankiw (2007) in the Ministry of Finance, 2012). Fiscal policy is the policy made by the government to direct the economy of a region through government expenditure and income as taxes. More specifically, the strategy is to balance funding using tax as the main source and debt if needed (Ma'ruf, 2008). Fiscal policies implemented in Indonesia as a developing country are expansive policies using the budget deficit instrument. The budget deficit is caused by inadequate income to finance increased government expenditure, one of which is the increase in government subsidies despite encouraging investment and interest rates. So, an expansionary fiscal policy with a deficit budget will not cause long-term problems. Formulating an appropriate and controlled budget financing strategy is important to remain budget healthy, credible and sustainable (Romer and Abhimanyu, 2011).

The national debt ratio/GDP, the government budget deficit ratio /GDP, the tax income ratio/GDP and the government expenditure ratio/GDP affect fertility decisions in developed countries (Zaid, 2013). Then, increasing government expenditure can reduce children in the household, cause the recent budget deficit, and make the tax burden in the future (Karimi, 1995). Increasing tax rates will stabilize the debt ratio on GDP so that an increase in tax revenue will sustain the fiscal policy. In Japan and Europe, the simulation of reducing fertility through special government expenditures for children exceeds the long-term fiscal costs by increasing tax rates, but the system is very different in other countries (Doi, 2011); (Fehr, 2008); (Guest and McDonald, 2000). Increasing income means to increase the quantity and quality of children, even the elasticity of the number of children is smaller than the elasticity of the quality. Fertility is influenced by income related to gender that the lower male income the lower child demand (income effect) while decreasing women's income has an ambiguous effect due to income effects contrary to the substitution effect in child demand. The previous study examines the effects of fertility on economic growth and the number of female workers. By presenting a positive feedback model from low fertility to higher per capita output, women's salaries and participation rates are relatively higher in the workforce causing low fertility. Therefore, Becker, Mincer, Lewis, Galor, and Weiln in Zaid (2013) suggest a feedback effect between economic activity and fertility. Jones (2011) found that fertility theory explanation that fertility and income relations are not strong. Some empirical studies state that countries with high GDP have low fertility and vice versa. The differences in several countries around the world due to their economic activities (Mankiw, Hall and Jones, Palivos, Tertilt in Cervellati, 2016). A low economy can be caused by a dependency ratio because the non-productive age populations are higher than the productive populations that affect the fiscal deficit. Reducing fertility is an important factor in economic development (Rajagukguk, 2010 and Ashraf, 2013). The government needs to increase child-care subsidies through the lump-sum tax and influence household income to reduce government expenditures (Haan, 2009; Fanti, 2004; Rosaria, 2013). China successfully applies the one-child policy continuously to solve the problem of economic growth because the female population spends its productive age to conceive, give birth and care for babies. As a result, they are difficult to gain income and it can overcome the problem of high outcomes which causes serious fiscal

deficits problems for the country (Zhao, 2011; Campbell, 2007; Fyustiazari, 2014; Yang and Wang, 2011; Feng, 2005). At the same time, assessing the economic impact of the one-child policy is not a welfare impact. Families can have more children because they can increase the utility of parents, even if it can reduce income per capita and economic conditions. So, the decision to have children depends on the economic conditions of a household (Blackorby, 2005; Benoit, 2015; Oguro, 2011). The United Nations predicts that the population will reach more than 9.2 billion by 2050, with almost 97% of them are in developing countries (Todaro & Smith, 2006). Regional fiscal development shows that regional expenditure of each province in Indonesia has increased but it is lower than income. To cover it, they perform debt between regions in Indonesia. The budget deficit continuously done by the provincial government will lead to bad fiscal sustainability.

The following is a graph of regional fiscal development



Source: Regional Financial Statistics BPS, 2018

Figure 1.1 Regional Fiscal of Povincial Govenrment, 2017

The impact of regional fiscal policies can affect the population in a region. To control population density through fertility, it is measured by TFR and birth rate. The development of the National TFR in 2017 reached 2.4. It is the result of the provisional report on Indonesia's demographic and health survey (SDKI) so that until now the Indonesian government has not reached the TFR target of 2.1. It is according to Prof. Murtiningsih Adioetomo revealing how the total fertility rate (TFR) was 2.1 and the impact on the fiscal (BKKBN, 2018). To achieve TFR 2.1 in 2015 CPR (equality in family planning must be 75.37%) and is likely to be achieved in 2031 (Nur'aini, 2012). The development of TFR among Provincial Governments can be seen in Appendix 2. The provincial governments that have TFR values targeted by the government are in East Java and Bali by 2.1 children per 1000 women, and the other 31 provincial governments still have TFR above 2,1. That there are still many provinces with high TFR values causes the National Total Fertility Rate is not achieved. To achieve it, the government needs fiscal policies. It is proven that the effects of fiscal policy can influence fertility decisions. This research is only focused on the effects of economic activity on fertility in the Provincial Government. Based on the information above, fiscal policy factors have an impact and influence on fertility, but the high impact of this policy in each region is different. However, there is still no research on how fiscal policy factors affect fertility. The fiscal policy of the provincial government in Indonesia is expected to provide a stimulus in sustainable and quality fertility decisions. The proper management of fiscal policies greatly influences the control of the number of children following the country's economic conditions. This study uses regional fiscal policy factors such as regional income, regional expenditure, regional debt, and regional deficits. Regarding fertility, this study uses the Total Fertility rate and Birth Rate in the provincial government in Indonesia during the cycle period. Therefore, this study

can explain regional fiscal policy variables (regional income, regional expenditure, regional debt, and regional deficit) that affect fertility (total fertility rate and birth rate) in the Provincial Government in Indonesia.

2. Literature Review

Regional fiscal policy is realized by giving funds, special autonomy and adjustments, as well as instruments to increase regional income potential to regional governments. Also, the central government allocates the ministry's budget to implement deconcentration and supporting tasks (Simanjuntak, 2002; Basri, 2004; Mardiasmo, 2009 in Akmad, 2012). Proper implementation of fiscal policy is a very powerful instrument to reduce the business cycle. In contrast, the wrong implementation will cause new problems in economic uncertainty and even worse (Mankiw, 2007). In Indonesia, the form of the new regional fiscal is distributed on the expenditure funded through transfer funds to the regions to spend based on the needs and priorities of each region. At the same time, regional fiscal for the revenue has not been implemented clearly that the central still controls most of the tax base. The provincial government still manages taxes in a relatively small amount due to restrictions on autonomy from the revenue side, so the role of local revenue is still small in financing local government expenditure (Brodjonegoro, 2003). Setiawan (2006) said that government expenditure is exogenous expenditure determined by how much the government budget is obtained from taxes. Fiscal policy is an effective instrument to influence macro aggregate in the long term. Newer growth models raise the interest in fiscal policy as an effective instrument for encouraging economic growth (Gallo, 2011). With enough revenue from the local government can reduce the growth rate by central transfers. In Nigeria, Lesotho, the Philippines, it is found a long-term relationship between national income and government expenditure (Chimobi, 2009; Thamae, 2013; E, Dogun, 2006). Whereas Udeaja (2015) found in Nigeria, that spending on health has a negative effect on economic growth.

An increase in tax revenue can reduce GDP while state expenditure can directly increase GDP growth in Indonesia. Low employee productivity is shown by low education and health conditions in several developing countries. low productivity causes a non-optimal output and difficulties in increasing economic growth. China is a country with a great number of employees that can increase economic growth (Rini, 2015). Woo (2009) believes that GDP is one of the indications of how successful a country is in managing its economy. Acemoglu (2007) and Li (2007) argue that high population growth has a negative and significant effect on GDP per capita. Floden (2013) said the new fiscal framework can increase public finances but a high budget surplus and GDP growth show one-third of the decrease in the debt ratio. Claeys (2008) finds that fiscal policy can easily resolve economic instability by increasing spending and raising taxes. applying direct taxes is necessary to reduce disposable income and it will reduce consumption and public savings. A decrease in public consumption will affect regional income. Allers (2010) found that the results of government spending and taxes can explain the interdependence of fiscal behavior between local governments. Karimi (1995) found that government expenditure and deficits negatively affect fertility in the Ricardian equivalent hypothesis. Doi, et al (2011) found that Japan increases tax rates to stabilize the debt ratio on GDP because it can sustain the fiscal policy. Fehr et al. (2008) argue that short-term fiscal savings on government spending for children exceed long-term fiscal costs and the fiscal system is very different across countries. For example, Guest and McDonald (2000) found greater social spending by the Australian Government arises from low fertility rates and will not occur until after 2040 with minimal tax increases. On the other hand, simulations

of lower fertility rates in Europe and Japan by Fehr et al. (2008) results in a lower employees and a significant increase in social assurance tax rates for both regions of the world. D'addio and D'Ercole (2005) used the GMM and PMG models in panel data for 16 OECD countries. That women work shows an increase in household finances and positively affects fertility decisions. The greater the salary ratio of women and men, the lower the fertility will be. Government policies in reducing public transfers to households for their children provided by the tax and benefits system can reduce fertility. As a result, households improve their careers and be more responsible for their children's costs. The main problem in managing the country's finances faced by Indonesia is the low tax revenue compared to government spending needs resulting in an increased budget deficit. The balance of fiscal policy must stimulate consumption by addressing the needs of growing populations (Park, 2010; Sriyana, 2008). The government can close the fiscal gap by changing deficit financing policies, step-by-step policy changes through increasing full pension age, increasing maximum taxable income for payroll taxes (Nishiyama, 2015). Policy reformation can adjust for smaller or better tax contributions, then this policy aims to reduce fertility in China (Coeurdacier, 2013). If the interest rate elasticity for child support is nearly zero and the debt accumulation in the economy is high, it is an inefficient economy that shows the financing of child support programs by issuing debt and using a lump-sum tax (Ishida, 2015). Tax incentive policies have a strong influence on fertility with some evidence of various responses (Milligan, 2004; Baudin, 2013). There are many low-education immigrations in the United States with high fertility which has high fiscal costs. But if low fertility will increase life expectancy and affect the labor market and fiscal system (Ronald and Timothy; Wildasin, 2008). An increase in childbirth is affected by reformation. The first birth is usually higher than the next birth but this increase cannot be explained by differential trends or macro factors (Brewer, 2009). The fertility rates of married white women are different. But, there is still no evidence of differences in married women with high fertility rates compared to single women with low fertility rates. Increasing fertility and immigration are not effective solutions to fiscal challenges (Baughman, 2006) and (George Kudrna, 2015). Guest and McDonald (2002) and Guest (2006) found that lower fertility rates result in higher future living standards in Australia, while empirical results from Hondroyiannis and Papapetrou (2005) show that increased fertility is related to higher per capita output in a European country.

Lower fertility results in a higher labor ratio using an abstract model of taxation. The aim of increasing taxes and social assurance contributions is needed to balance the government budget (Fehr 2000 and Kulish et al, 2010). But Kotlikoff et al. (2007) found that low capital reflects a significant increase in salary and income tax rates. The same results were simulated by the multiregional OLG demographic model developed by Fehr et al. (2004, 2008). In Canada, the government provides benefits for pregnant women through a tax system levied from public consumption taxes (Oguro, 2011; Benoit, 2015). Marrie, 2002; Fehr and Ujhelyiova, 2010), assume that children are not as a cost to the family but is an investment for the whole community. Increased fertility depends on the family policy on how to address the problem of high economic activity on the number of children desired. But there is a need to increase child allowance so that the better quality of welfare of present and future generations.

Longevity has a direct utility effect while fertility does not. High birth rates result a fiscal increase (Andersen, 2012). In developing countries fertility has a negative relationship on human development but is positive on income. Human development and higher education

and a healthy population lead to lower fertility rates, which can cover gaps with developed countries' economies (Hafner and Foulkes, 2013). This fiscal policy instrument stimulates an increase in births. Incremental births and additional immigrants can help alleviate the fiscal situation in a long period (Ronald, D; (Kudla, 2014, 2018). Meng (2003), Chamon and Prasad (2010) limit family loan capacity and interactions between demographics and public spending on education through government budget constraints. An increase in government spending will bring a decrease in fertility. Rational parents assume the increase in the current budget deficit as an increase in the future tax burden (Karimi, 1995). Fertility has a small effect on microeconomics compared to macroeconomics because household time allocation decisions limit the function of the fertility implus response. As a result, an increase in government spending negatively through pronativist subsidies (Graneli, 2016) Fertility has a reverse cyclical nature, because when childbirth costs increase then fertility will decrease because the state does not facilitate pension subsidies children, so they delay giving birth untill they improve economic conditions and have stable incomes (Orsal, 2010). Whereas Kudla (2014) and Edith (2002) with exogenous fertility, households can determine the maximum number of children owned to avoid high household financial incentives due to increased birth rates, financial incentives are very important for the probability of giving birth in Quebec and ROC from 1980 to 2000. Then Gori (2017) said that fertility depends on culture, beliefs and social norms specifically related to institutions or ethnic groups followed by linguistic and religious contours. Hadiyanto (2017) in West Java with the result that the higher the level of the household economy, the lower the fertility level because parents begin to prefer higher quality children. Mahendra (2016) concludes that education is very important for women in fertility in Indonesia. Likewise, Toulemon (2005) stated people with higher education realize their lower fertility. In contrast to Pungan (2016), there is no difference between women with junior and senior highschool and above and where women work, at home or outside the home, on fertility in the city of Palangka Raya in terms of poor households. Arsene Dumont in Hadiyanto (2017) wrote an article titled Depopulation et Civilization discusses a theory called theory do social capillarity that a person wants to increase his position or improve his socio-economic situation will decrease the desire to give birth or have children, and it indirectly suppresses birth rates. This is consistent with Todaro & Smith's (2006) household microeconomic theory that income will be negatively related to the desire to add children. Income and children's expenses have a positive impact on fertility. The first birth as a measure of the fertility capacity of parents positively influences the number of children. Low fertility makes children educated, have good skill and professions with high incomes indicating there is an exchange between the quantity and quality of children in the UK during the industrial revolution supporting modern economic growth theories (Galor and D, 2000; Galor, 2011; Klemp, 2017). In France, the low awareness of having children due to the birth of the first child is more compatible so stability in work becomes a prerequisite before having the first child. Then women who have been unemployment relatively delay the birth of the first child compared to working women (Méron, 2002). Bloom (2009) argues that the low fertility rate in Spain is caused by high unemployed women. The correlation between employment ratios and fertility rates in various countries can change when the level of women's job search increases. So, the relation between the labor market and salaries is the key to understand the behavior of fertility rates in each country (Erosa, 2002; Da Rocha, 2005). In Canada, the importance of salary increases in female labor over the past 40 years can explain the decline in fertility rates since 1960. Fertility factors have decreased due to higher education, women's job and greater financial capacity (D'Addio, 2005; Rosenzweig (2009).

3. Theoretical Model

In the context of development, the Regional Government Budget policy is expected to respond to both economic development and people's lives, so a flexible fiscal policy is needed (Abhimanyu, 2011). The influence of fiscal policy on fertility is based on the business cycle model. This research model is a modification of Zaid (2013), using a business cycle model with moral behavior on the demand for children by determining the optimal number of children in high-debt regions or central-dependent regions with the reason that giving birth in the worst economic conditions so that children will not bear the debt in the future. The problem is the ability of households to maximize utility functions. In the household sector, maximizing lifetime utility is obtained from consumption ($c_{i,t}$), employee ($l_{i,t}$), kids ($n_{i,t}$) and moral behavior or household responsibilities ($m_{i,t}$). Then in the next period access the risk of government bonds ($b_{i,t}$) by paying the real interest rate (r_t). This study replaces the labor income tax rate into consumption tax τ_t^w. The Consumption Tax Model is taken from the Kudla study (2018) that households will pay consumption tax rates on total regional income derived from community labor income ($w_t\, l_{i,t}$) with the real interest per hour (w_t), and cost to grow a child (q_t). Households are assumed to act morally so that utility (k) is obtained outside of this research model. But the utility will decrease because the actual children's choice ($n_{i,t}$) will deviate from the optimal number of children (n_t^*). Then the household needs to know the optimal number of children based on its utility function in determining the child demand ($m_{i,t}$= m ($n_{i,t}$, n_t^*)), the household is responsible for the child's demand is greater than 0 ($m_{i,nt} > 0$)and the number of children is greater than the optimal number of children ($n_{i,t} > n_t^*$). So, this problem is formulated as the following equation.

$$\max\{c_{i,t}, l_{i,t}, n_{i,t}, m_{i,t}, b_{i,t}\}_{t=0}^{\infty} E_0 \sum_{t=0}^{\infty} \beta^t U(c_{i,t}, l_{i,t}, n_{i,t}, m_{i,t}) \quad (3.1)$$

forming

$$c_{i,t} + b_{i,t} + q_{i,t} n_{i,t} - (1 - \tau_t^w) w_t l_{i,t} + (1 + r_{t-1})\, b_{i,t-1} \quad (3.2)$$

u ($c_{i,t}$, $l_{i,t}$, $n_{i,t}$, $m_{i,t}$) is a function of the period utility and β is the subjective discount factor of the household. So Optimization can generate the following conditions in the equation:

$$-\frac{u_{l,t}}{u_{c,t}} = (1 - \tau_t^w) w_t \quad (3.3)$$

$$u_{ct} = \beta(1 + r_t) E_t\, (u_{ct} + 1) \quad (3.4)$$

$$u_{nt} = u_{c,t}\, q_t - u_{m,t}\, m_{n,t} \quad (3.5)$$

Equations (2.3) and (2.4) show labor standards and Euler consumption conditions. Then equation (2.5) sets the number of requests for children in this model. The number of children this model is a function of consumption, the cost of growing a child and household moral considerations in determining children as their responsibility. Problems in the household are the assumption of a tax on consumption while empirical analysis focuses on total regional income consisting of local tax revenue, regional non-tax revenue, and central transfer revenue. The total tax burden of households in a lump sum is in accordance with the total regional income collected by the local government. From this equation, the tax does not affect the household optimally. In taxation, the tax burden is introduced as regional income. Regional income is the only source of tax in this model to maintain focus on moral behavior, and it is in line with Galor and Weil (1996); Da Rocha and Fuster's (2006) discussion of quality versus quantity of children. Furthermore, Jones (2011) discussed it as empirical evidence on the quality-quantity tradeoff in this study combined into one. According to Galor and D, 2000; Galor, 2011; Klemp, 2017, the theory of long-term growth sets a tradeoff

between quantity and quality of children because technological advances encourage parents to increase investment in their children by reducing their children. However, all costs of growing children can be seen as accounting, including the costs of having high-quality children can be obtained through regional spending following fiscal policy rules.

In the production sector, working households will produce products, and also, they will earn income. Income earned by working people is used to meet current and future needs. So, in the production sector, the company employs labor to produce output (y_t) with the following technological equation.

$$y_t = f\ (l_t) \quad (3.6)$$

Then company will select employeess to maximize it:

$$\max\ \{l_t\}\infty_{t=0}\ \sum_{t=0}^{\infty}[f\ (l_t) - \ w_t l_t] \quad (3.7)$$

By maximizing profits, the company formulates the following standard labor demand conditions:

$$f_{l,t} = w_t \quad (3.8)$$

It shows that the equilibrium product of labor is equal to real salaries. This equation and equation 3.3 is used to determine the balance in the labor market. Then in the market-clearing, there is a balance of regional expenditure in the following equation:

$$\tau_t^w w_t l_t \ + \ b_t \ = \ g_t + \ (1 + \ r_{t-1})\ b_{t-1} \quad (3.9)$$

With the exogenous process of g_t, r_t dan τ_t^w, the competitive balance will be as the sequence (b_t, c_t, l_t, n_t, q_t, w_t) so that the equilibrium in equation (3.10) is obtained and it is then put into equation (3.5) to be as the following:

$$u_{nt} = \ u_{c,t}\ \left((1 - \ \tau_t^w)w_t\, l_{i,t} + (\ 1 + \ r_{t-1})b_{i,t-1} - \ c_{i,t} + b_{i,t}\right) - \ u_{m,t}\, m_{n,t} \quad (3.10)$$

Competitive balance is general because of the three exogenous processes. In combination, there is a consideration of the economic response to shocks to g_t and l_t individually by keeping other factors to be constant. Because households behaving morally (m_t)) are determined by the number of children (n_t), the value of the previous variable follows the last value, so the moral behavior of the household (mt) is not included in the competitive balance. Finally, the total productivity factor is assumed to be constant to know the impact of fiscal policy in influencing fertility on the Provincial Government in Indonesia by forming functional and assuming utility functions for the next period in the household. By inputting equations (3.12) and (3.4) into (3.11), then it becomes as the following equation:

$$u_{nt} = \ \left(\beta(1 + r_t)E_t\ (u_{ct} + 1)\right)\left((1 - \ \tau_t^w)g_t + \ (1 + \ r_{t-1})\ b_{t-1} - \ b_t l_{i,t} + (\ 1 + \ r_{t-1})b_{i,t-1} - \ c_{i,t} + b_{i,t}\right) \quad (3.11)$$

Three cases corresponding to the expansionary fiscal policy are that the government must increase spending without changing the tax rate of workers because there is no increase in regional income. Secondly, the government must reduce consumption tax rates without changing regional spending, increasing spending and cutting consumption tax rates simultaneously. It affects local government deficits especially local government debt.

Different from regional spending and regional income, debt and regional deficits are not exogenously determined by the optimal household because they are determined endogenously. Then the impact of fiscal policy on local governments in the fertility decision is assumed to be in the constant real interest rate (r) to form the following equation:

$$u_{nt} = \ \left(\beta E_t\ (u_{ct} + 1)\right)\left(g_t - \ b_t l_{i,t} - \tau_t^w g_t + \ \tau_t^w b_t l_{i,t} \ - \ c_{i,t} + b_{i,t}\ \right) \quad (3.12)$$

From equation (3.12) the child utility function is determined by fiscal policy measured by regional income, regional expenditure, regional debt, and regional deficit. Kudla (2018) said that fiscal policy spurs fertility through an increase in consumption tax of goods consumed by adults. Consumption tax in this study is an indirect tax, which is tax obtained from goods and services in the provincial government. Meanwhile, evaluation on the impact of fiscal policy on fertility in the Provincial Government in Indonesia is in equation (3.12) by fiscal policy variables in the region such as regional income (PD), regional expenditure (BD), regional debt (UD) and regional deficit (DD). Mubarak (2012) in Haslam (2017) stated that the calculation of TFR has a weakness that there are no dead women during the fertile period, all married and have children with a pattern like ASFR. Even though, this is not real. So the fertility variable used is the Total Fertility Ratio (TFR) and Birth Rate (AK), the equation is as the followings

$$U_{nt} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots\ldots\ldots\ldots + \varepsilon \quad (3.13)$$

To expand the business cycle model variables towards fertility decisions, the basic model in equation (3.13) is transformed to be a linear relationship that can be analyzed using econometrics as follows.

Equation 1:

$$TFR = \beta_0 + \beta_0 + \beta_1 PD + \beta_2 BD + \beta_3 UD + \beta_4 DD + \varepsilon \quad (3.14)$$

Equation 2:

$$LogAK = \beta_0 + \beta_1 LogPD + \beta_2 LogBD + \beta_3 LogUD + \beta_4 LogDD + \varepsilon \quad (3.15)$$

4. Results

In panel data analysis, the first step is to choose the best model from the three models, namely Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). In addition to the Chow test and the Hausman test, a statistical value comparison will also be used on each model to strengthen the test results that the selected model is the best. The result of the chow statistic test value is 45.40 with prob.cross-section chi-square value of 0.0000 <0.05 for TFR while for Ak chow statistic test value is 976.94 with prob.cross-section chi-square value of 0.0000 <0.05 meaning that FEM is more appropriate than PLS. Hausman test is to choose the best model between FEM or REM . Then the statistical value of the hausman test is 2.07 with a random cross-section prob value of 0.7230> 0.05 for TFR, while for the hausman test statistical value of 1.30 with a random cross-section prob value of 0.8619> 0.05 meaning that REM is more appropriate than FEM. Thus it is necessary to proceed with the LM test. The Lagrange Multiplier Test is to determine the best choice either CEM or REM. The results are for TFR with a lagrange test value of 1080.85 with prob.cross-section chi-square value of 0.0000 <0.05, the best choice is REM instead of CEM. As for AK with lagrange test value of 1215.61 and prob.cross-section chi-square value of 0.0000 <0.05, the best choice is REM instead of CEM. Thus, we use panel data regression with Random Effect Model (REM). The followings are the results of REM panel data regression for the TFR Variable.

Table 4.1. Estimated Panel Data Regression Results of REM on TFR in Provincial Government in Indonesia

Variable	TFR			LogAK		
	Coef	Z test	Probability	Coef	Z test	Probability
PD	-0,061392	-1,41	0,160***	0,0000218	1,93	0,054**
BD	0,0542273	1,26	0,209***	-0,0000198	-1,78	0,076***
UD	0,016702	1,36	0,175***	-0,0000042	-1,32	0,186***
DD	-0,0738209	-1,71	0,088***	0,0000228	2,04	0,041**
Cons	2,541397			4,930469		

Source: Data Processing, 2019

**** = significant value 10%, ** = significant value 5% and * = significant value 1%*

Then the panel data regression results were obtained by the Random Effect Model. The regression equations for the dependent variable TFR and birth rate are as follows:

TFR = 2,541397 - 0,061392 PD + 0,0542273 BD + 0,016702 UD - 0,0738209 DD (3.15)

Log AK = 4,930469 + 0,0000218PD - 0,0000198BD – 0,00000420UD + 0,0000228 DD (3.16)

The results of the random effect model with total fertility rate indicate that regional income has no negative effect, regional expenditure and regional debt have no positive and significant effect on the TFR of 33 provincial governments in Indonesia. Mubarak (2012) in Haslam (2017) revealed that the calculation of TFR has a weakness that there are no women dying during the fertile period, all married and have children with a pattern like ASFR, even though this is not real. This weakness is why the results obtained are not matched. But the regional deficit has a negative and significant effect on the TFR. Different results obtained with the birth rate shows that regional income and regional deficits have a positive effect, regional expenditure has a negative and significant effect on birth rates. But regional debt has no negative and significant effect on birth rates. Regional income has no negative and significant effect on the TFR, due to the inability of households to pay taxes to the provincial government. This is because people spend their income to meet their consumption and or their income is still low. The TFR in the provincial government in Indonesia is still high. As d'addio and d'Ercole (2005) said that the greater the salary ratio, the lower the fertility will be. Similarly, Kulish et al (2010) found that the lower fertility, the higher labor ratio. Whereas Blackorby (2005) found that high fertility leads to lower tax rates. As a result, regional government income has decreased and does not meet targets per year. Household contributions to the government are still low so they do not care about the policies made by the government. In line with Sriyana (2008), the main problem in Indonesia is the ineffective and inefficient management of government finances resulting in low tax revenue. On the contrary, Oguro (2011) and Benoit (2015) argued that to increase consumption tax, Canada provides allowances for pregnant people through a tax system that is levied on public consumption taxes. So the government must achieve the consumption tax or local tax target to increase regional income.

Then, regional income results in a positive and significant effect on birth rates. This is in line with Thomas and Kevin M (2004), Kurt A.David (2013) Zaid (2013) and Kudla (2018) that income is strongly influential in the birthrate. Children are future human resources and state assets in increasing income by taxes. The higher the regional income, the lower the TFR, and birth rate and vice versa. In the provincial government in Indonesia, regional income is still low so that the TFR and birth rate are higher. Hadiyanto (2017) and Mahendra (2016) revealed that education greatly influences birth rates because educated people will plan a small number of children with optimal quality rather than having many children but not

qualified. In Indonesia, it is still impossible to make a policy to applying fine if every family has more children than government determination. Indeed, this policy violates human rights, this is the policy of Todaro and Smith (2011). Regional expenditure does not affect and is significant to the TFR because the equivalent Ricardian theory in the provincial government in Indonesia is not applicable. Households do not care about the policies made by the government to increase regional spending and do not make household decisions to reduce child demand. As a result, the TFR in the provincial government in Indonesia is still high. Differently, regional expenditure results have a negative and significant effect on birth rates. This study is in line with Lucia G (2016) that an increase in birth rates has a negative effect on expenditure. This is due to regional spending used by the government not to improve the quality of health and education but for infrastructure development. The higher regional expenditure, the lower TFR and birth rates, and vice versa. Setiawan (2006) argued that government expenditure is an exogenous expenditure determined by how much the government budget is obtained from taxes. But in reality, the provincial government uses regional expenditure not in accordance with the regional revenue owned. The Provincial Government makes very strict supervision in the policy to get children because the TFR value between provinces is still 80% which has the highest TFR above 2.3 to 3.4. Karimi (1995) believed that high government spending will cause a decrease in fertility.

Regional debt has no positive and significant effect on the TFR and has no negative effect and is significant on birth rates. The higher the regional debt, the lower the TFR and birth rate and vice versa. But, the provincial government debt used to cover regional spending does not make households to reduce their fertility. There are no household contributions to help government policies, so an expansionary fiscal policy with a business cycle model will aggravate the economy. In line with Lapan's (1990) research, government debt is a tax for future generations and defines debt as a reduction in welfare because it distorts fertility decisions so that the equivalent Ricardian hypothesis is not applicable. On the other hand, Zaid (2013) stated that moral householders will not increase children's demand because the country is in a period of increasing debt and national deficits. Regional deficits have a negative and significant effect on TFR. this study is in line with Karimi (1995) that government deficits have a negative effect on fertility. Then, regional deficits have a significant positive and significant effect on birth rates. Because fertility in the Provincial Government in Indonesia is still high, as moral households and contribute to the government, they should control the demand for children as long as the provincial government is in a high deficit due to low regional income.

5. Conclusion

Based on the results, the panel data analysis using the random effect method shows that regional income and regional expenditure have no significant effect on the TFR. On the contrary, regional income and regional deficits have a positive effect, regional spending has a negative and significant effect on birth rates. On the other hand, the regional deficit has a negative and significant effect on the TFR. Then regional debt has no effect and is significant on the TFR and birth rate in 33 provincial local governments in Indonesia. The cause of the results obtained is not appropriate because the value of TFR has a weakness in measuring fertility, there are no women dying during the fertile period, all married and have children with a pattern like ASFR. Even though this is not in accordance with reality. Birth rate measure fertility with the number of babies born. Households have not been able to contribute to helping the policies made by the provincial government so that fertility in each

provincial government is still high except for 2 provincial governments that have TFR in accordance with national TFR targets, namely East Java and Bali. Households spend their consumption for more children and it causes their children to pay high taxes in the future on policies made by the government to cover debts due to regional income deficits. Therefore, the Ricardian Equivalent theory does not apply to this research. The business cycle model in developing countries can be used based on moral household behavior which will not burden the children to cover sustainable regional deficits. In this study, the provincial government issues a policy for family heads who have more children than the policy made by the government. But, this policy does not violate human rights so this policy can reduce TFR or birthrate in Indonesia. Galor and D (2000), Galor (2011) and Klemp (2017) believe that low fertility makes children well-educated, have great skill and high-income professions. It shows that there is an exchange between the quantity and quality of children in the UK during the industrial revolution supporting the theory of modern economic growth. The central and regional governments make a large percentage of spending on child subsidies in education and health in the next budget. Then improve the addition of data samples for Indonesia to obtain more optimal results and change different analysis models such as VAR and VECM. It is better to add macroeconomic variables to be more extensive and obtain optimal results about the impact of TFR and birth rates. As targeted by the government so that the TFR value per 5 years decreases to avoid booming populations and on the other hand the regional debt increases every year which will have an impact on the fiscal deficit. So the government must avoid a continuing fiscal deficit every year to avoid bankrupt.

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