CHAPTER IV

RESULTS AND DISCUSSION

A. Research Variables Overview

1. Fathers' Permanent Income

The following is descriptive statistics of fathers' permanent income, which is the average income in 1993, 1997 and 2000.

Table 4.1. Descriptive Statistics for Father's Income

	Income of		
	All Fathers	Fathers in Urban	Fathers in Rural
Min	IDR 96,351	IDR 106,704	IDR 96,351
Max	IDR 555,970,496	IDR 559,970,496	IDR 139,343,312
Mean	IDR 5,864,762	IDR 8,918,775	IDR 3,284,456
Std. Dev.	IDR 31,707,028	IDR 44,856,821	IDR 11,927,256

Source: Data processed, Stata

Based on the information in the table above, the overall permanent income of the father is in the range of IDR 96,351-555,970,496 with an average of IDR 5,864,762. The overall average is greater than the average the permanent income of fathers who live in rural areas (IDR 3,284,456) but smaller than the average income of fathers who live in urban areas (IDR 8,918,775). If it is compared based on the father's area of living, the permanent income range of fathers in urban areas is greater than the permanent income of fathers in rural areas. The lowest permanent income value from fathers living in urban areas (IDR 106,704) is only slightly greater

than fathers living in rural areas (IDR 96,351). However, the highest permanent income in the two regions differs greatly. The highest rate of permanent income of fathers in rural areas (IDR 139,343,312) represents only 25% of the highest rate of permanent income of fathers living in urban areas (IDR 555,970,496). This shows a higher level of inequality in urban areas than in rural areas. The standard deviation of fathers' permanent income in urban areas (IDR 44,856,821) is greater than fathers' permanent income in rural areas (IDR 11,927,256).

2. Children's Permanent Income

The following is descriptive statistics of children's permanent income which is the average income in 2007 and 2014.

Table 4.2. Descriptive Statistics for Children's Income

	Income of		
	All Children	Male Children	Female Children
Min	IDR 189,971	IDR 189,971	IDR 353,977
Max	IDR 371,994,016	IDR 139,196,816	IDR 371,994,016
Mean	IDR 17,338,421	IDR 18,630,053	IDR 14,624,410
Std. Dev.	IDR 22,954,589	IDR 17,594,599	IDR 31,225,848

Source: Data processed, Stata

The information in Table 4.2. shows that the highest value of children's permanent income is owned by a female (IDR 371,994,016) while the lowest is owned by a male (IDR 189,971). In fact, the highest permanent income for males does not reach half of the females, which is only 37% of the highest permanent income of females. However, interestingly, the average

permanent income of boys (IDR 18,630,053) is the highest among all categories. Obviously, it can be explained by the standard deviation of the income group of males (IDR 17,594,599) which becomes the lowest among groups, indicating that the income discrepancy for males is certainly lower than females.

3. Education

The following is a summary of data on the attainment of father and children education used in this study.

Table 4.3. Proportion Table of Education

Level of Education	Years of Schooling	Father	Children
Unschooled/ Early Childhood	0 years	7% (72 people)	1% (14 people)
Basic Education	1-9 years	70% (709 people)	36% (360 people)
Secondary Education	10-12 years	15% (152 people)	39% (396 people)
Higher Education	>12 years	8% (78 people)	24% (241 people)
	Total	100% (1011 people)	100% (1011 people)

Source: Data processed, Stata
Note: The percentage with frequency values in parentheses are reported

Based on Table 4.3., the attainment of father's education is mostly at the level of basic education, which is as much as 70% of the total sample or as many as 709 people. It can be seen that the educational attainment received by the next generation has improved. Shown by the number of

children who only reached the basic education level (36%), which is lower than the fathers. Supported also by the increasing number of people who reach higher education levels in the generation of children, specifically as many as 241 people from only 78 people in the generation of the father.

4. Age

Age becomes one of the control variables that restrict this research. As of the data used has the following age characteristics.

Table 4.4. Descriptive Statistics for Age

	Minimum	Maximum	Mean	Std. Dev.
Father	40 years	49 years	44.46 years	2.50 years
Children	20 years	35 years	29.18 years	2.81 years

Source: Data processed, Stata
Note: Values shown are the average values across waves

Based on the table above, the sample used includes fathers aged 40-49 years and children aged 20-35 years, with an average age of fathers is 44.46 years and the average age of children is 29.18 years.

5. Children's Gender

The following is shown the condition of the sample based on the gender category used in this research.

Table 4.5. Proportion Table of Children's Gender

	Frequency	Percentage
Male	685 people	67.75%
Female	326 people	32.25%
Total	1,011 people	100%

Source: Data processed, Stata

Based on the table above, the number of females compared to males is close to the ratio of 1:2. From a total of 1,011 samples used in this study, there were 326 females and 685 males

6. Fathers' Area of Living

The following are the characteristics of the sample based on the father's living area used in this research.

Table 4.6. Proportion Table of Fathers' Area of Living

	Frequency	Percentage
Urban	463 people	45.96%
Rural	548 people	54.04%
Total	1,011	100%

Source: Data processed, Stata

Based on the table above, as many as 548 people are fathers who live in rural areas, and 463 people are fathers who live in urban areas.

B. Data Quality Test Result

1. Classic Assumption Test

To ensure that the linear regression model is categorised as Best Linier Unbiased Estimator (BLUE), it is necessary to conduct a classic assumption test which includes normality test, heteroscedastic test, and multicollinearity test.

a. Normality Test

The normality test is used to determine whether the residuals of a regression model are normally distributed or not. The normality test result is on the next page.

Table 4.7. The Result of Normality Test

Shapiro-Wilk W test for normal data					
Variable	Obs	W	V	z	Prob>z
kidlogearn	1,011	0.98095	12.133	6.184	0.000
fatlogearn	1,011	0.93607	40.722	9.184	0.000
kidage	1,011	0.98445	9.9050	5.681	0.000
fatage	1,011	0.97474	16.094	6.883	0.000
E	1,011	0.98220	11.340	6.016	0.000

Source: Data processed, Stata

Based on Table 4.7., the normality test conducted shows probability value of all variables which is smaller than α (0.00<0.05). Therefore, the null hypothesis can be rejected so the data is not normally distributed. However, based on the central limit theorem, if the sample is more than 30, the assumption about the distribution of the population is inconsequential hence the sample is considered normal distribution (Kwak & Kim, 2017).

b. Heteroscedasticity Test

Heteroscedastic test is performed to determine if the variant of the error is constant or not. It was conducted with the following results.

Table 4.8. The Result of Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of kidlogearn
chi2(1) = 0.86
Prob > chi2 = 0.3540

Source: Data processed, Stata

Based on the test results above, the value of chi2 probability is greater than α (0.3540>0.05) which means there is no heteroscedasticity in the regression model or the variance is constant.

c. Multicollinearity

Multicollinearity test is used to determine whether there is a relationship among independent variables. VIF values in the multicollinearity test obtained are shown below.

Table 4.9. The Result of Multicollinearity Test

Variable	VIF	1/VIF
fatage	1.01	0.987499
kidage	1.01	0.989151
fatlogearn	1.01	0.992599
Mean VIF	1.01	

Source: Data processed, Stata

Table 4.9. shows that all variables has VIF value less than 10 or tolerance 1/VIF greater than 0.1. Therefore, it can be concluded that the linear regression model is free from multicollinearity.

2. Endogeneity Test

Endogenous testing is needed to ensure that variables acting as instruments of the Two-stages Least Square (2SLS) model can only correlate with the dependent variable indirectly through endogenous variables. The result of the endogeneity test is shown on the next page.

Table 4.10. The Result of Endogeneity Test

Tests of endogeneity		
Ho: variables are exogenous		
Durbin (score) chi2(1)	=	4.07257 (p = 0.0480)
Wu-Hausman F(1,1544)	=	4.07691 (p = 0.0482)

Source: Data processed, Stata

Based on the table above, the Durbin (0.0480<0.05) and Wu-Hausman (0.0482<0.05) tests show the probability less than α, meaning that the independent variable (instrumental variable) has endogeneity properties.

C. Analysis Test Result

1. Multiple Linear Regression

Linear regression is conducted to distinguish the intergenerational income elasticity (IGE) by regressing the log of permanent income of children on fathers'. The adjusted value in an estimation using an adjustment for life cycle bias. From the result we see that the IGE is overestimated by the unadjusted model. The analysis result is as follows.

Table 4.11. Linear Regression Result Adjusted To Life-Cycle Bias

	IGE	Standard error	R^2	P>|t|
Father-child				
Adjusted	0.166	0.030	0.037	0.000
Unadjusted	0.170	0.030	0.032	0.000

Source: Data processed, Stata

According to the table above, the estimated IGE is statistically significance at 1% level of significance (p>|t| = 0.000). The result shows a low level of intergenerational income elasticity (0.166) in Indonesia. Which

means high mobility of income. That number indicates that 16.6% of the parental income position is transmitted to the next generation. The unadjusted value, where it does not use age variables as controllers showing higher value (0.170) with only a little difference.

Furthermore, this study also estimated IGE for male and female. This is done to determine differences in income mobility based on gender as there are differences in the characteristics of permanent income for male and female as shown in the previous section. The results of the IGE estimation for male and female are as follows.

Table 4.12. Linear Regression Result Adjusted To Life-Cycle Bias

	IGE	Standard error	R^2	P>|t|
Father-son				
Adjusted	0.182	0.033	0.050	0.000
Unadjusted	0.178	0.033	0.042	0.000
Father-daughter				
Adjusted	0.191	0.059	0.059	0.000
Unadjusted	0.206	0.059	0.037	0.000

Source: Data processed, Stata

From the table above it can be seen that there are differences between IGE of male (0.182) and female (0.191). As much as 18.2% of father's income will be transmitted to male and 19.1% to female. The difference between male and female is 0.9%. Both results are also not highly different from the IGE of all children (0.165). The unadjusted value for males differs as much as 0.04 from the adjusted value, while for females it differs as much as 0.015 from the adjusted value.

In addition, below are the results of IGE estimates categorised by fathers' area of living to see differences between IGE in urban and rural areas.

Table 4.13. Linear Regression Result Adjusted To Life-Cycle Bias

	IGE	Standard error	R^2	P>|t|
Urban				
Adjusted	0.201	0.043	0.056	0.000
Unadjusted	0.211	0.042	0.052	0.000
Rural				
Adjusted	0.109	0.045	0.024	0.000
Unadjusted	0.117	0.044	0.013	0.000

Source: Data processed, Stata

Based on Table 4.13., IGE in rural (0.109) and urban areas (0.201) have a difference of 0.012, which means that the transmission of father-to-child income in urban areas is greater than in rural areas. Twenty and one-tenth percent of father's income will be transmitted to children in urban areas, and 10.9% of the father's income will be transmitted to children in rural areas. In addition, the difference between adjusted and unadjusted value is 0.010 for urban and 0.008 for rural.

2. Transition Probability

Table 4.15. shows the transition probabilities to see the change in one categorical income across generation. While the ranges of income for each group are shown on the Table 4.14.

Table 4.14. Ranges of Income in All Group

Group	Father	Children
1st percentile	IDR 96,350–1,109,361	IDR 4,541,444–4,459,957
2nd percentile	IDR 1,111,631–1,990,784	IDR 6,019,748–11,879,854
3rd percentile	IDR 2,020,583–3,835,535	IDR 11,899,602–21,039,362
4th percentile	IDR 3,861,697–555,970,496	IDR 21,109,682–371,994,016

Source: Data processed, Stata

The results shows that children whose father in the fourth group are 42.54% more likely to have high income themselves once they grew up. This number is higher than the probability had by children in the fourth group whose father from the first (14.71%), second (14.29%), and third group (28.57%). However, that number is yet smaller compared to the probability of children whose father in the fourth group to fall into the lower income group (57.46%).

Table 4.15. Transition Probability

	Children			
Father	1st 25%-group	2nd 25%-group	3rd 25%-group	4th 25%-group
1st 25% group	28.68%	32.35%	24.26%	14.71%
2nd 25% group	38.35%	24.81%	22.56%	14.29%
3rd 25% group	16.54%	24.06%	30.83%	28.57%
4th 25% group	17.16%	18.66%	21.64%	42.54%

Source: Data processed, Stata

Then, it was seen that children whose father in the first group had probability as much as 32.35% to level up themselves to the second group. It is higher than the probability to fall back to the first group (28.68%).

However, unfortunately, children whose father in the second group has 38.35% probability to fall into the first group. This number is greater than the probability to keep being in the second group (24.81%) or rise to the third (22.56%) or fourth group (14.29%). Furthermore, the probability of children whose father in the third group to keep being in the same group is as much as 30.83%. That probability number is smaller than the probability for them to fall to the lower group (40.60%) and higher than to rise to higher group (28.57%).

3. Explanatory Power

Two-stages least square (2SLS) is used to assess the explanatory power of education for the IGE in Indonesia. The result will be divided by the value of IGE to get the value of explanatory power. The two-stages least square result is as follows.

Table 4. 16. The Result of Two-stages Least Square

	Coefficient	Standard error	R2	P>|t|
Education	0.122	0.020	0.093	0.000

Source: Data processed, Stata

Table 4.15. shows that the coefficient value of education as instrumental variable is 0.122. It means that if children get one-year increase in schooling, children's permanent income will also increase by 0.122%. Then, to get the value of explanatory power, the coefficient of education will be divided to 0.166 (IGE in Indonesia) which results 0.7349. Therefore, averagely speaking, the education channel in Indonesia can explain around

73.49% of IGE indicating it has important role in explaining intergenerational income elasticity.

D. Discussion

1. Intergenerational Income Mobility

The estimated elasticity of intergenerational income (IGE) in general (without restrictions on gender or living area) is 0.166. This IGE calculation usually generates values between 0 and 1 (Moonen & Van den Brakel, 2011). According to the IGE value generated, it implies that 16.6% of the father's permanent income will be passed on to the children. Although the literature discussing IGE of Indonesia, in particular, is still very limited. There is one study written by Purbowati (2018) found that IGE of Indonesia ranges between 0.087-0.118, which is quite close to the results obtained in this research. These differences in IGE results might be caused by the use of samples from different age ranges, considering that research on IGE is very close to the issue of life-cycle bias, which can be attenuate by including the children's and fathers' age square as a control variable in the regression model (Jin et al., 2019).

This study also provide the unadjusted result for each category of IGE estimation. Then, averagely, the unadjusted result showing higher value of IGE but with little differences. The similar case also happened to the research conducted by (Moonen & Van den Brakel, 2011) when comparing the IGE estimated between the adjusted and unadjusted. The difference are vary from 0.045 for father-child, 0.096 for father-son, and 0.005 for father-

daughter. It is not so far different with what is found in this study where the differences are 0.004 for father-child, 0.004 for father-son, and 0.015 for father-daughter. However, although the differences are not much different, Nybom & Stuhler (2016) notes that life-cycle variation had to be accounted for was recognized in unadjusted model, but it was generally assumed that including age controls in the regression equation would suffice. The models, which account for life-cycle stage with individual-invariant age coefficients, assume that different individuals do not have systematically different age profiles for earnings, wages, or income (Solon, 1992).

Then, the low IGE values implying a relatively high degree of mobility across generation. Then, a higher degree of mobility across generation represents the condition of a country where the members of society, regardless of their backgrounds, have more equal opportunities to become high-income individuals than before. It means that personal resources and abilities, rather than parental economic status, play a primary role in determining their incomes (Fortin & Lefebvre, 1998). Therefore, the results of the IGE estimation in this study can also illustrate the low inequality of opportunity which gives the possibility to also reduce the inequality of outcomes (such as income and wealth) in the future.

In discussing the likelihood to gain equal opportunities, the gap issue within genders becomes relevant to study. Significantly, the estimated IGE of male (0.182) shows a lower value than female (0.191) where females have a 19.1% chance of being on the same level of income as the father,

whereas males have greater mobility and opportunity to determine their own destiny as boys are only 18.2% more likely to be at the same level of income as the father. Nevertheless, the difference in income mobility between genders is complicated to eliminate. It is in line with an empirical evidence pointing out that from the phenomenon of wage differences received by men and women, 93.3% of them cannot be explained by socio-economic variables, in other words, 93.3% of the wage differential that occurs in society comes from gender discrimination (Taniguchi & Tuwo, 2014). However, the gap between IGE for female and male does not only occur in Indonesia. Since Qin, Wang, & Zhuang (2016) also distinguished IGE of males and females in China and found that IGE of female (0.464) were higher than IGE of male (0.415).

The fathers' area of living also produces different outcomes. IGE of children whose fathers from rural areas (0.109) is smaller than those whose fathers living in urban areas (0.201). It signifies that the income mobility of children from rural areas is higher than in urban areas. It possibly caused by opportunities for urbanization had by children from rural. Urbanization certainly can provide a greater possibility of getting a higher income than the father. However, failure is also able to make them fall back into poverty cannot be avoided after their migration to the city. As urbanization, a ubiquitous phenomenon in a developing world, can be a convincing component of the national poverty reduction as long as the right conditions are met and the appropriate policies are placed (UNPF, 2008). For this reason,

distinguishing the right transmission channel becomes so important, to advance the opportunities until it gives a positive impact on each individual of the society.

2. Child and Parental Income Transitions

The results of the transition probability in Table 4.14. show the nonlinearity of the relationship between father and child income. Children from underprivileged families do not always befall into the poverty line with the low-income position. So do children from prosperous families, they will not always naturally wander in wealth after they have grown up. Even though the study certainly indicates that the mobility of middle-low income society is higher than the middle-up income society. Roughly speaking, poverty is less likely to be inherited than wealth. In numbers, the fathers in the fourth group have higher probability (42.54%) to have children stay in the fourth group than the fathers in the first group to have children trapped in the first group (28.68%).

The transition probability result is further aligned with the results of IGE, showing a relatively high degree of mobility. Since the transition probability of income from father to children within the same group is not more than 50%. The chance of fathers in the first group to have children keep in the first group is 28.68%, the chance of fathers in the second group to have children also in the second group is 24.81%, and so forth.

However, there is a weakness in the analysis of transition probability as it cannot show the upward and downward mobility of income

for the floor and ceiling group (Atkinson, 1983). It is not viable to know the probability of father in the fourth group to have children with a higher income than the fourth group. As well as fathers in the first group, there is also no probability value pointing the chance to have children with income lower than the income amount in the first group.

3. Education as Transmission Channel of Intergenerational Income Elasticity

According to the result of the analysis, education is significantly influenced by the father's permanent income. By dividing the TSLS results to the IGE, it is found that education has a power to influence children's permanent income and simultaneously can describe the rate of IGE by 73.49%. This number signifies an essential role of education in influencing employment opportunities, social outcomes, and individual earnings, to boost long-term income mobility (Mocetti, 2007). This number also can explain the phenomenon in nowadays world, where many prestigious companies promising a higher level of income for a newcomers with higher education background compared to, for instance, secondary education background.

Moreover, unlike low-income families, high-income fathers have more ability and willingness to invest more in children's education (Jin et al., 2019). As a consequence, children who grew up in impoverished families are improbable to attend school until a higher level of education (Crosnoe, Mistry, & Elder, 2002). Whereas, the persistence of educational attainment will be able to encourage an increase in the permanent income of the children

itself. Based on the result of this study, every one year increase in children's schooling, it can increase as much as 0.122% in children's permanent income.

However, unfortunately, according to Central Bureau Statistic of Indonesia (Indonesia, 2019), there is a high gap between the highest and lowest quintile of income groups for the gross participation rate of Indonesian people who continue their education up to university level. In fact, in the last four years, around 60% of university participants are from the highest quintile of income group. Whereas the people in the lowest quintile of income group only contributed less than 10%. This justifies that the income inequality occurring in Indonesia is not caused by opportunities that are not evenly distributed, but rather because there are differences in human capital owned by people from low-income groups and high-income groups. Hence, without an adequate competitive value, even though the opportunity has been equally shared, individuals will not be able to compete in the labour market to get a better job to better off their wellbeing.

Therefore, the improvement in children's educational attainment cannot solely be surrendered to the father as parents. Given that there are still 25.67 million people of Indonesia (9.66% of the population) who live under the poverty line with income less than IDR 410,670 per month (Central Bureau of Statistics, 2019). Government presence and intervention is needed on the development of Indonesian children's education, which is statistically proven to have the ability to effectively increase children's permanent income and explain IGE of Indonesia.