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PENSION COVERAGE AND CHILDREN'S EDUCATION INVESTMENTS IN INDONESIA

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ABSTRACT

Pension guarantees have long been considered to provide benefits for retired households. Pension guarantee premium payments start while still working until before retirement. However, on the other hand, households must also prepare to invest in children's education. The existence of pension guarantees is thought to influence the allocation of household expenditure, especially children's education expenditure. This research wants to answer whether pension coverage can affect children's education expenditure through altruistic or non-altruistic parental motives. The relationship between pension security variables and children's educational investments was studied using collected cross-section data. The research results show a positive and significant relationship between pension fund coverage and children's education expenditure. It is hoped that this research can contribute to the government regarding the expansion of pension coverage to improve the welfare of households, especially older people and children, in the future.
Kata kunci : Pension Coverage, Education Investment, Ageing Population

ABSTRAK

Jaminan pensiun selama ini dianggap dapat memberikan manfaat bagi rumah tangga pensiunan. Pembayaran premi jaminan pensiun tersebut dimulai saat bekerja sampai sebelum pensiun. Namun, di sisi lain, rumah tangga juga harus mempersiapkan investasi pendidikan anak. Adanya jaminan pensiun diduga memengaruhi alokasi pengeluaran rumah tangga, khususnya pada pengeluaran pendidikan anak. Penelitian ini ingin menjawab pertanyaan apakah cakupan jaminan pensiun memang dapat memengaruhi pengeluaran pendidikan anak melalui motif orang tua altruistik atau non-altruistik. Hubungan antara variabel jaminan pensiun dan investasi pendidikan anak dipelajari dengan menggunakan data cross-section yang dikumpulkan. Hasil penelitian menunjukkan adanya hubungan positif dan signifikan antara cakupan dana pensiun dengan pengeluaran pendidikan anak. Penelitian ini diharapkan dapat memberikan kontribusi kepada pemerintah terkait perluasan cakupan jaminan pensiun sehingga dapat meningkatkan kesejahteraan rumah tangga khususnya lansia dan anak di masa mendatang.
Kata kunci : Jaminan Pensiun, Investasi Pendidikan, Penuaan Penduduk

INTRODUCTION

The pension guarantee motif has been known in the world and developing countries as a form of incentive in the future (Mu & Du, 2017). Indonesia is one of the developing countries that entered the aging population phase in 2021 but with reasonably low pension coverage. In 2021, the number of older people in Indonesia will be around 29.3 million (10.82 percent), but participation in pension insurance is still below 10 percent (BPS, 2022a). This percentage is relatively low compared to pension insurance coverage in developing OECD member countries, which is already above 50 percent. However, on the other hand, participation in household pension insurance is thought to influence the allocation of household expenditure (Mu & Du, 2017). One of the household expenses that will be affected by pension insurance coverage is education investment.

Household pension coverage will influence parents' decisions to invest in children's education (Mu & Du, 2017). When a household is covered by pension insurance, the family should pay mandatory pension contributions, which is thought to reduce household expenses, especially investments in children's education. Meanwhile, children's human capital investment determines a country's economic development (Kye, 2016). Education is

an investment in children's human capital related to children's welfare (Wei et al., 2021) and the labor market's income (Chi & Qian, 2016).

Education expenditure is a proxy for children's human capital investment (Chi & Qian, 2016). Children's education expenditure and pension coverage are thought to be related. In Mu & Du (2017) research, evidence was obtained that pension coverage influences children's education expenditure as an evaluation of the expansion of pension insurance programs in China's government and non-government sectors. Lachowska & Myck (2018) compared household savings and expenditure over time and between cohorts due to pension reform in Poland.

Based on previous research, the relationship between pension coverage and children's education expenditure is limited. It has not been investigated in developing countries with low and middle-income per capita (LMICs), such as Indonesia. The novelty of this research study is that it offers a comprehensive analysis to show a relationship between pension guarantees and investment in children's education at a micro level at the main non-elderly (non-sandwich) household level in Indonesia.

Households without older people are considered relevant for this research because they can examine the influence of pension coverage on children's education expenditure without mixing the effect of two time periods, namely when paying pension guarantees and when receiving pension guarantees. These two periods cannot be separated in the National Socio-Economic Survey (Susenas) questions as a research data source. Then, to find out the period for paying pension contributions and receiving pension income, the research approach was used to question the largest source of household income. This scenario was carried out to minimize the combination of the period for paying pension contributions and the period for receiving pension income in one household.

In this research, we want to know whether pension coverage affects children's education expenditure in Indonesia in elderly households with the scenario of when to pay mandatory pension contributions. This research is expected to contribute to knowledge regarding the importance of pension/old age security and investment in children's education. Then, it can provide information and references for policymakers. In particular, we are evaluating the pension guarantee program to increase capital investment in children's education and household welfare in Indonesia.

LITERATURE REVIEW

The influence of pension coverage on children's education is explained through two parental motives: parents with non-altruistic motives and parents with altruistic motives (Mu & Du, 2017). Changes in pension coverage ($\bar{m}$) on children's education expenditure are applied using the comparative statics equation by (Mu & Du, 2017), which has been derived from equation (5). The results are as follows:

$$\frac{de}{d\bar{m}} = -\frac{\beta\alpha U_2^{12}V' + \beta\gamma\tau U_2^{11} + U_1''}{2\beta\alpha\gamma U_2^{12}V' + \beta\alpha^2 U_2^{22}V'V' + \beta\alpha U_2^2 V'' + \gamma^2\beta U_2^{11} + U_1''} \quad (1)$$

Based on equation (1), U_2^{12} is parents' marginal utility for changes in consumption with changes in children's welfare, which is assumed to be positive ($U_2^{12} \geq 0$). Meanwhile, from the concave utility function, we obtain $U_2^{11} < 0, U_1'' < 0$, and $V'' < 0$.

If parents have non-altruistic motives (α=0), then mandatory pension will reduce children's education expenditure ($\frac{de}{d\bar{m}} < 0$). However, if parents have altruistic motives (α>0), positive results are obtained, or children's education expenditure increases even though they pay pension contributions/contributions. It means parents do not expect positive transfers from children in the second period ($\gamma \leq 0$).

Previous studies underlying this research include (Mu & Du, 2017), where the study focuses on expanding pension program reforms that began in 2001 in China for parents who work in the state and non-state sectors. The results show that only the pension coverage variable positively and significantly influences children's education expenditure.

In Poland, Lachowska & Myck (2018) compared household savings and expenditure over time and between cohorts affected and unaffected by pension reform.

Chen & Zhou (2022) examine how the sandwich generation's changing financial support patterns with parents are related to children's educational expenditure. Chi & Qian (2016) investigated factors that can influence education expenditure in a household with four groups of determinants, namely household income level, child's gender, child's education level, parental characteristics such as education and employment level, family size, Hukou status, and area of residence.

Based on the results of the theoretical and empirical review, the author formulates a hypothesis to answer the aim of this research, namely that pension coverage with non-altruistic motives has a negative effect. Households in the unit of analysis that are covered by children's education expenditure spend lower education costs than families not covered by the guarantee program. Then, pension coverage positively affects children's education expenditure in the scenario of paying pension contributions to parents with altruistic motives.

METHOD

The data source used in this research is pooled cross-section data for 2019, 2020, and 2021 sourced from the March Susenas. The unit of analysis used as research observation is households with children still in school for less than 18 years (G3), without older people (G1), paying for children's education costs, and with the largest source of income from working household members (scenario of paying pension contributions). The number of households sampled in this study was 405,955, with details of 130,184 for each, 136,635, and 139,136 in 2019, 2020, and 2021 (BPS, 2022b).

In this study, the dependent variable is children's education expenditure. Children's education expenditure is approximated by household expenditure (Chen & Zhou, 2022). Education expenditure comes from Susenas KP in block IV.2. Children's education expenditure (educexpG3>0) is household education expenditure with G3 for a year, converted into average monthly education expenditure. Then, for linearity, children's education expenditure is transformed into logarithms (lneducexpG3).

The independent variable in this research is the pension coverage variable. The pension coverage variable is approximated from pension security ownership (Mu & Du, 2017). Households (HH) that have/receive one of the pension guarantees (JP)/old age guarantees (JHT) or a combination of both are categorized as having pension guarantees or coded (1) as the treatment group. Meanwhile, households that do not have/receive JP/JHT are coded (0) as the control group.

Some of the control variables used are total net household expenditure (expend_net) after deducting children's education expenditure, economic status (wealth index), number of household members, number of children still attending school at the primary education level, number of children still attending school at the primary education level. Then, the age of the Head of household, the gender of the Head of the family, the highest level of education of the household head, and social protection. These control variables have been tested in previous research, such as research by (Yan et al., 2021), Chen & Zhou (2022), Chi & Qian (2016), and Mu & Du (2017), and have been proven to affect the education expenditure variable.

This study used the OLS method to estimate the three-year relationship between variables with pooled cross-section data. The pooled cross-section is data from many individual samples in a specific period (Dielman, 1983). The parameter estimation model using pooled cross-section data with the OLS model is as follows:

$$lny_{it} = x'_{it}\beta + \gamma_{it} + \varepsilon_{it} \quad (2)$$

Then, to determine the effect of pension coverage on children's education expenditure, a regression equation model is prepared in equation (9).

$$lneducexpG3_{it} = \alpha + \beta_1 pension_{it} + \sum_{n=1}^{k} \varphi X_{n,it} + \emptyset_t + \varepsilon_{it} \quad (3)$$

The regression model uses children's education expenditure, pension coverage, and control variables. Where α is the constant of the education expenditure of the i household's child and the t time; β_1 is the coefficient of the pension coverage variable for household i and time t ($pension_{it}$); φ is the coefficient of the set of control variables X_n (1,..,n) of the i household at the time t; $\emptyset_t$ is the time coefficient for the t year and ε_{it}. It is a random error (error term).

RESULT AND DISCUSSION

The percentage of non-sandwich households that pay for children's education with the largest source of income from working household members as the unit of analysis in this study is 405,955 households or 41.01 percent of the total Susenas sample. The percentage of analysis unit households with JP alone is around 2.69 percent of the total Susenas sample households. Households with JHT alone are everywhere at 2.90 percent. The rate of households with both pension guarantees is approximately 2.34 percent. However, if divided by total households in the analysis unit, households with JP alone are around 6.55 percent. Households with JHT alone are around 7.08 percent. Households with both pension guarantees are 5.72 percent.

The unit of analysis used, namely, households with children, not elderly, have children's education expenditure and with the largest source of income from working household members to find out how the pension guarantee program impacts children's education expenditure. This scenario is a proxy for households that pay mandatory pensions because household members have not yet reached old age, and the most considerable income is not from pensioners. The percentage of households in the analysis unit with pension insurance coverage is around 7.91 percent of the total households in the analysis unit.

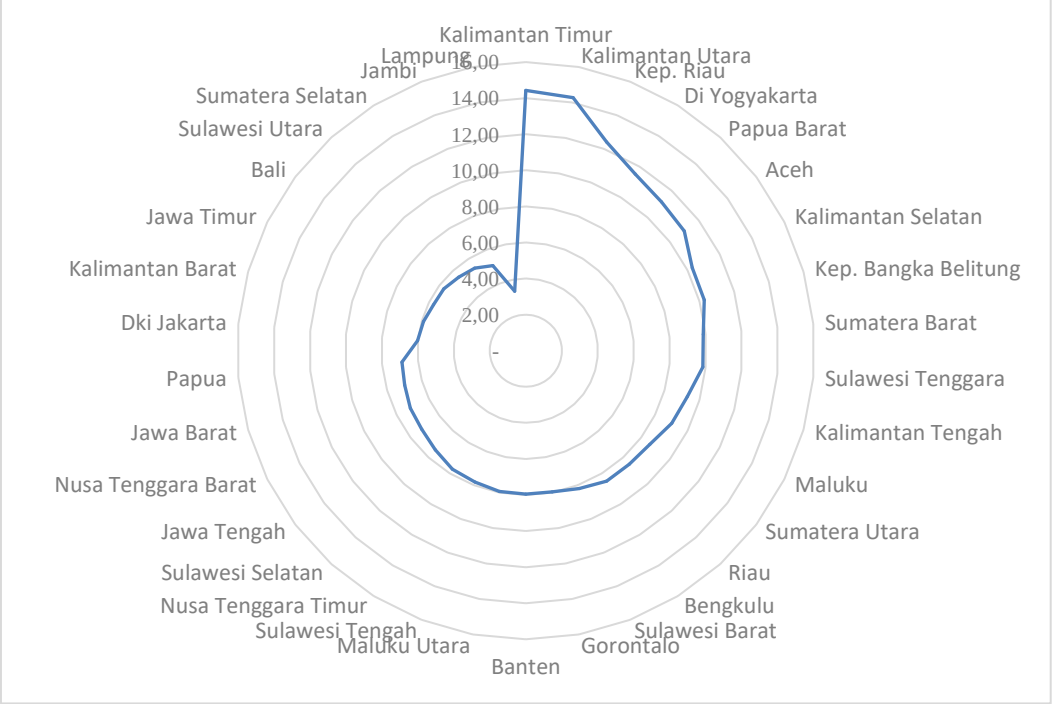

Figure 1 Ranking of Provinces in Indonesia Based on the Percentage of the Number of Units of Analysis Covered by the Pension Guarantee Program

Non-sandwich households that pay for children's education with the largest source of income from working household members and are covered by the pension guarantee program are spread across provinces in Indonesia. The number and percentage of analysis

unit households covered by the pension guarantee program by region are explained in Figure 1.

The province with the highest percentage of households in the analysis unit with pension insurance coverage in Indonesia is East Kalimantan, around 14.43 percent. They were followed by North Kalimantan, Riau Islands, DI Yogyakarta, and West Papua, each with 14.27 percent, 12.40 percent, 11.52 percent, and 11.16 percent. Meanwhile, the province with the lowest percentage of HH in the analysis unit with pension insurance coverage is Lampung, which is only around 3.36 percent. The other four provinces are Jambi, South Sumatra, North Sulawesi, and Bali.

Table 1 shows the research variables' average value and mean differences test according to pension coverage. The child education expenditure variable (ln) between households not covered and covered by the pension guarantee program shows a significant difference at the 1 percent significance level. Families covered by the pension guarantee program incur higher costs for children's education than households not covered by the pension guarantee program. Likewise, the variables of net household expenditure (ln) and wealth index, the average values of which are also significantly different. Households covered by the pension guarantee program have a higher average weight and economic status than households not covered by the pension guarantee program.

Table 1 Average Value and Mean Differences Test Research Variables According to Pension Coverage

Variable	Not Covered by the Pension Guarantee Program	Covered by the Pension Guarantee Program	*Mean differences*
Children's Education Expenditures (*ln*)	11,165	11,853	-0,688***
Net HH Expenditures (*ln*)	15,102	15,709	-0,608***
Economic Status *(Wealth Index)*	2,894	4,329	-1,435***
Number of Household Members	4,507	4,498	-0,001
Number of Children Attending Schools at Basic Education Level	0,914	0,908	0,006
Number of Children Attending Schools at Secondary and Higher Education Levels	0,598	0,612	-0,015***
Age of Head of Household	43,811	44,946	-1,135***
Gender of Head of Household (*Male*)	0,939	0,952	-0,012 ***
Education level of Head of household	2,119	3,196	-1,076***
PIP	0,143	0,030	0,113***
PKH	0,219	0,017	0,201***
Area of Residence (*rural*)	0,620	0,394	0,225***

Then, the number of household members in the HH who are and are not covered by the pension guarantee program is not significantly different, namely 4.50. The number of children attending primary education is not entirely different compared to households not covered by the pension guarantee program, namely around 0.91. Meanwhile, families covered by the pension guarantee program have more children attending secondary and higher education. Variable characteristics of household heads such as age, gender, and level of education of household heads also differ significantly, where household members who are covered by the pension guarantee program have a higher percentage and a higher

level of education compared to households who are not covered by the pension guarantee program.

However, for the social protection variables, namely PIP and PKH, the percentage of households covered by the pension guarantee program is significantly lower than those not covered by the pension guarantee program. Then, based on area of residence, more Households covered by the pension guarantee program live in urban areas. Meanwhile, households not covered by the pension guarantee program mostly live in rural areas.

Table 2 Regression Results of Pension Coverage Variables and Control Variables on Children's Education Expenditures with Period Scenarios for Paying Pension Contributions

Variable	Children's Education Expenditures			
	1	2	3	4 (*robust*)
Pension Coverage	0.0582***	0.0769***	0.0469***	0.0522***
	(0.00558)	(0.00542)	(0.00547)	(0.00571)
Net HH Expenditures	0.768***	0.747***	0.743***	0.750***
	(0.00313)	(0.00304)	(0.00305)	(0.00333)
Economic Status *Wealth Index* (Low)	0.174***	0.139***	0.131***	0.133***
	(0.00458)	(0.00445)	(0.00446)	(0.00432)
Economic Status (Middle)	0.235***	0.185***	0.174***	0.182***
	(0.00451)	(0.00439)	(0.00442)	(0.00434)
Economic Status (High)	0.333***	0.275***	0.258***	0.274***
	(0.00448)	(0.00437)	(0.00444)	(0.00446)
Economic Status (Very High)	0.473***	0.434***	0.399***	0.419***
	(0.00530)	(0.00515)	(0.00524)	(0.00544)
Number of Household Members	-0.118***	-0.0626***	-0.0647***	-0.0672***
	(0.00109)	(0.00122)	(0.00124)	(0.00133)
The year 2020	0.0283***	0.0273***	0.00497	0.00275
	(0.00350)	(0.00339)	(0.00348)	(0.00347)
The year 2021	0.0448***	0.0432***	0.0238***	0.0201***
	(0.00349)	(0.00338)	(0.00347)	(0.00356)
Number of Children Attending Schools at Basic Education Level		-0.332***	-0.309***	-0.311***
		(0.00242)	(0.00247)	(0.00260)
Number of Children Attending Schools at Secondary and Higher Levels		-0.0112***	-0.0374***	-0.0431***
		(0.00260)	(0.00263)	(0.00272)
Age of Head of Household			0.00915***	0.00874***
			(0.000186)	(0.000189)
Gender of Head of Household (Male)			-0.130***	-0.129***
			(0.00590)	(0.00610)
Education level of Head of household (Elementary)			0.0801***	0.0790***
			(0.00609)	(0.00635)

Variable	Children's Education Expenditures			
	1	2	3	4 (*robust*)
Education level of Head of household (Secondary)			0.113***	0.117***
			(0.00648)	(0.00670)
Education level of Head of household (High)			0.142***	0.150***
			(0.00627)	(0.00658)
Education level of Head of household (College)			0.178***	0.180***
			(0.00676)	(0.00709)
PIP				-0.0217***
				(0.00400)
PKH				0.104***
				(0.00368)
Constanta	-0.151***	0.254***	-0.0411	-0.148**
	(0.0453)	(0.0440)	(0.0450)	(0.0492)
N	405955	405955	405955	405955
R^2	0.275	0.317	0.324	0.325

Table 2 shows the regression results explaining the influence of pension coverage and control variables on children's education expenditure with the scenario of the period for paying pension contributions (mandatory pension). Columns 1 to 4 show the control variables based on several individual characteristics and HH. Control variables (1) are HH characteristics: total net HH expenditure, economic status (wealth index), and number of household members. Control variables (2) are child characteristics, namely the number of children still attending school at the primary education level and the number of children still attending school at the secondary and higher education levels. Control variable (3) contains the characteristics of the Head of the household, namely age, gender, and educational status of the Head of the family. Then, the control variable (4) is social protection, namely PIP and PKH.

The pension coverage variable tested with the control variable HH characteristics positively and significantly influences children's education expenditure. Likewise, when controlled again for child characteristics, household head characteristics, and social protection, the pension coverage variable positively and significantly influences the outcome variable. The regression results show that households covered by the pension guarantee program have substantially higher education expenditure than households not covered by the pension guarantee program, around 5.22 percent.

Column (4) shows the results of testing the regression model between the dependent and independent variables, along with the four characteristics of the control variables. The control variable with the most significant influence on HH education expenditure is net HH expenditure, namely 75 percent, which has a positive and significant value. Then, other HH characteristic variables are economic status and the number of household members. Total net HH expenditure has a positive and significant relationship, which means that the higher the percentage of total net HH expenditure, the rate of children's education expenditure will increase. These results follow research by Chen & Zhou (2022) and Fang et al. (2022), where HH expenditure as a proxy for income is directly proportional to children's education expenditure. The number of HH members negatively correlates with children's education expenditure. It follows the research results by Chi & Qian (2016), namely that the larger the family size, the lower the child's education expenditure.

The financial status variable positively and significantly influences children's education expenditure at all levels of the economic situation. The higher the economic status, the

greater the influence. Furthermore, the variable number of household members also has a negative and significant effect, namely that the greater the number of household members, the potential to reduce education expenditure by 6.72 percent.

The control variable for the number of children at the primary education level negatively and significantly affects children's education expenditure. Increasing the number of children at the primary education level will reduce education expenditure per child by 31.1 percent. Likewise, the variable number of children attending secondary and higher education levels negatively and significantly affects the outcome variable. However, the coefficient is lower, namely 4.31 percent. It means that every increase in the number of children attending secondary and higher education levels will reduce education expenditure per child by 4.31 percent.

The age of the Head of household has a positive effect on children's education expenditure. In contrast, the gender of the male Head of household is negatively related to children's education expenditure. These influences are following research by Chen & Zhou (2022), Chi & Qian (2016), and Mu & Du (2017). Following empirical studies by Patterson, Zuriashe Patterson (2016), social protection significantly affects outcome variables.

Based on the Head of the household's education level, the higher the Head of the household's education level positively and significantly increases children's education expenditure. Heads of households with basic education levels spend 7.9 percent more on education costs than heads who do not attend school/have not completed primary education. It is also the case with Heads of households with junior secondary, senior secondary, and tertiary education levels, each of which spends 11.7 percent of children's education costs, 15 percent, and 18 percent higher compared to Heads of households who do not attend school/have not completed primary education. Meanwhile, the education level of the Head of household has a positive and significant effect. Children's education expenditure increases at higher levels of Head of household education. These results follow the research results of Chi & Qian (2016).

The social protection variable has a significant influence on children's education expenditure. The Smart Indonesia Program (PIP) negatively correlates with children's education expenditure, namely 2.17 percent. Meanwhile, the Family Hope Program (PKH) positively affects children's education expenditure by 10.4 percent. Then, for the year variable 2020, the value is not significantly different compared to 2019. Meanwhile, in 2021, it is positive and quite different, with 2.01 percent higher than in 2019.

Then, a heteroscedasticity test was carried out using the Breusch-Pagan/Cook-Weisberg test (Verbeek, 2004). Appendix 1 shows significant results, meaning that the variance of the residuals is not constant or there is variation between residuals. One way to overcome the problem of heteroscedasticity is to perform robust regression models. The results of the multicollinearity test in Appendix 2 show no indication of high multicollinearity between the residuals and the covariates of the independent and control variables simultaneously. It can be seen from the VIF value below 5 and 10 or the 1/VIF value above 0.2 (Waluyo, 2010). The average VIF value in the regression model is 1.98.

The robustness check test is carried out by comparing with the analysis unit whose most significant source of income comes from retirees and testing heterogeneity based on high altitude areas, dummy islands, and child gender. The comparison test results between the two analysis units based on the largest source of household income in Appendix 3 also showed positive and significant developments in the analysis unit with the largest source of income from retirees. It means households covered by pension guarantees and already receiving pension income spend 12 percent more on children's education than households not covered by pension guarantees. Then, when there are older people in the family or a sandwich household, pension coverage still has a positive relationship of 2.82 percent to children's education expenditure, but it is not significant.

The heterogeneity test is carried out in panel A in Appendix 4. based on an area of residence, namely urban and rural. The results show that in both regions of living, namely urban and rural, the pension coverage variable remains positive and significantly influences

children's education expenditure. However, in Households in rural areas, the pension coverage variable coefficient is lower than in urban areas. The pension coverage variable has a higher influence on children's education expenditure in urban areas than in rural areas.

Based on the island dummy (panel B) in Appendix 5, the pension coverage variable on almost all islands in Indonesia has a positive and significant effect on children's education expenditure, except on the islands of Bali and Nusa Tenggara, which were positive but not significant. The highest coefficient of the pension coverage variable is on Java Island at 14.5 percent. Then, followed by Kalimantan Island at 13.6 percent, Sumatra Island at 8.52 percent, Sulawesi Island at 6.93 percent, and Maluku-Papua Island at 5.65 percent.

Next, test heterogeneity based on the gender of the child in Appendix 6. This test uses an approach to the number of genders of boys (numeducG3_m>0) or girls (numeducG3_w>0) because there is a possibility of a combination of both genders of children in one RT. The effect of pension coverage is positive and significant on children's education expenditure, where the outcome is higher for girls (4.09 percent) than boys (3.7 percent).

Panel D is a test of heterogeneity based on the year shown in Appendix 7, and there are significant differences in the three years of observation. During the COVID-19 pandemic in 2020 and 2021, the pension coverage variable positively and significantly influenced children's education expenditure. The highest pension coverage variable coefficient is in 2021, namely 7.56 percent, meaning that pension coverage can potentially increase children's education expenditure by 7.56 percent.

CONCLUSION

Based on inferential analysis, the pension coverage variable has a significantly positive effect on the child education expenditure variable in households in Indonesia. It means that the allocation of children's education expenditure to families in the analysis unit covered by the pension guarantee program is 5.2 percent higher than that of children's education expenditure to households not covered by the pension guarantee program.

Positive results indicate altruistic parental motives Mu & Du (2017), where parents continue to provide financial support and care about their children's education even though they pay pension contributions and do not expect a return on their children's education in the future. It means that even though households pay pension insurance contributions, this does not reduce education expenditure for children. On the contrary, it increases children's education expenditure. It shows that families in Indonesia are optimistic and care about increasing investment in children's education even though the pension guarantee program covers them.

The author hopes that this research can provide information for the government regarding pension guarantee programs and investment in children's education. Policies for expanding and socializing the pension guarantee program can also be considered, considering that Indonesia is currently in the aging population phase. So, it is hoped that multigenerational prosperity can be realized in the future and increase sustainable economic and human development.

Future research can use panel or longitudinal data with more specific survey data sources. The influence of older people in the household can also be seen in how it relates to children's educational investments by using a survey that has precisely separated the ownership of pension security per household member with a representative sample size. Then, suppose an endogeneity problem is due to sample selection in future research. In that case, you can use other estimation methods, such as instrumental variables (IV) or two-stage least squares (2SLS), to further strengthen the analysis of the relationship between pension coverage and investment in children's education expenditure.

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