

What Determines the Participation in the Pension Fund? Evidence from Indonesia

Sondang Samosir¹, Indra Tumbelaka^{1*}, Muhammad Algifari¹, Nunung Nuryartono²,
Syamsul Hidayat Pasaribu², Anna Fariyanti²

Indonesia's population is the 4th largest in the world. Population growth in Indonesia is predicted to increase every year followed by the increased proportion of the elderly population. The increase in the elderly population needs special concern, since the elderly population will be economically vulnerable in the future. Therefore, pension fund is important for the future. Various literatures show that financial literacy is one of important determinant factors of individuals' future planning, especially pension fund. This study aims to explain factors that determine the participations in the pension fund program in Indonesia. The data used is financial literacy and financial inclusion survey from the OJK in 2016 and 2019. The method used in this research is logit and probit regressions. The results show that pension fund participants are determined by financial literacy, income level, years of education, place of residence, savings account ownership, insurance ownership, BPJS employment ownership, government employees, retirees, housewives, time deposit ownership, stock ownership, and ATM users. If pension fund is differentiated by the type of Defined Benefit (DB) Pension Funds and Defined Contribution (DC) Pension Funds, the affecting factors for defined contribution pension funds are more varied than defined benefit pension funds. However, since the most important factor determines pension fund ownership is financial literacy, improving financial literacy is required to increase the awareness of people to independently participate in pension fund program.

Keywords: Pension fund, logit, probit, financial literacy.

¹Otoritas Jasa Keuangan (OJK), Indonesia.

²Faculty of Economics and Management, Institut Pertanian Bogor, Indonesia.

*Corresponding author: indra_t@ojk.go.id.

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Introduction

Indonesia currently has a population of 269 million or 3.49% of the world's total population. It is the 4th most populous country in the world after China, India and the United States (Worldometric, 2020). The proportion of the elderly is projected to be around 19% of the total population in 2045 (BPS, 2019). This projected high percentage poses a challenge to provide a decent life in retirement/through pension fund programs implemented by the Government or private companies. The issue is encountered by all countries. United Nations (2019) states that the global population aged 65 years and over will reach 703 million people in 2019 and is expected to double to 1.5 billion people by 2050. Therefore, countries are starting to take steps to adequately address this issue. The retirement period is a condition of concern for some people since the elderly population is economically vulnerable in the future. Retirement is a period of changing roles, desires, views of life, and lifestyle for each individual (Schwartz, 1974; Kubicek et al. 2011; Hershey et al. 2010)

The basic principle of pension funds is the relationship between the company and employees, where the company collects contributions from each employee during the working period and provides pension funds when employees retire from the company (McLauchlan, 1907). Traditionally the pension fund system has been operated on the basis of "Pay as You Go (PAYG)", meaning that we pay pension contributions now and can enjoy future contributions after retirement. This system has continued in the last 4 decades because workers feel the benefits of pension funds in the elderly (Pecchenino and Pollard, 2005). In general, there are two types of pension plans, namely defined contributions and defined benefits (McGiil, 1984).

Retirement fund planning is important for the future. Moorthy *et al.* (2012) define pension fund planning as an action taken by individuals to achieve life goals in the future by preparing and setting aside some of the money they have. Individuals who do not prepare a pension plan from the early days, may not be able to achieve their expected retirement goals, and they will still need a job even though they have entered retirement to continue earning income (Asokumar and Jais, 2018).

Individuals in various countries are expected to be more responsible for their financial well-being in the elderly with pension funds. However, household surveys in various countries have revealed that most households are not able to manage finances well (Agarwal *et al.*, 2009; Calvet *et al.*, 2007), especially individual financial planning for retirement.

Financial literacy is an important part of achieving financial prosperity (Krause, 1991; Vosloo *et al.*, 2014). This is because low financial literacy will have an impact on financial decision making based solely on perceptions and a lack of desire to receive financial advice (Anderson *et al.*, 2017). Some literature suggests that financial literacy has an influence on household/ individual decisions to plan finances for retirement. This is evident in developed countries such as the Netherlands (Van Rooij, *et al.*, 2011) and the United States (Lusardi and Mitchell, 2011). The problem in developing countries is that households or individuals still have a low level of financial literacy. Based on research by Klapper *et al.* (2015) show that the Indonesian Financial Literacy Index is 32%, ranking 82 out of 131 countries. This shows that the level of individual financial literacy is still low. Households or individuals with low literacy will have an impact on their welfare in retirement, this is a threat in the future (Niu *et al.*, 2020). Therefore, the aim of this study is to explain what factors determine the

participation in the pension funds in Indonesia, particularly to seek the effect of financial literacy.

Overview of Demographic and Pension Fund in Indonesia

Demographic shift in Indonesia

The Inter-Census Population Survey (Supas) of the Central Statistics Agency (BPS) in 2015 showed that the projected value of Indonesia's population in 2015-2045 will reach 269.6 million people with 185.34 million people being the productive age group (15-62 years). The large proportion of the population of productive age has implications for the demographic bonus and economic prosperity. This demographic bonus is predicted to end in 2036 and has implications for an increase in the number of elderly people by 19% until 2045 (BPS-Statistic Indonesia, 2018). The large proportion of the elderly population requires further handling, especially in relation to financial risks when entering retirement age and having a decent life at retirement/ old age. The role of pension funds is very much needed in overcoming this problem.

Overview of Pension Fund Schemes in Indonesia

Pension fund schemes in Indonesia consist of two main schemes, namely the Defined Benefit Program and the Defined Contribution Program. The normal retirement age in Indonesia is 56 years old in 2018 and gradually increases at the age of 65 in 2043, increasing for a year to the retirement age every three years. A pension benefit can be received by participants after 15 years of premium contribution. Pension fund schemes implemented in Indonesia are divided into two main schemes: Defined Benefit (DB)

Since July, 1 2015 employees in the private sector are covered by social insurance. The current pension benefit is actually 1%. Past income is assessed in line with inflation. The contribution value can be paid up to IDR 8.1 million per month. The minimum pension fund after 15 years of contribution is IDR 331 thousand, can have a pension benefit of IDR 3.97 million per month. Pension payments are indexed based on the rate of price inflation.

a. Defined Contribution (DC)

Employees in the private sector can also receive a pension fund scheme with a defined contribution scheme. Since 1993-2013 BPJS Ketenagakerjaan (Manpower Social Security Administration) has organized an Jaminan Hari Tua-JHT (Old Age Security, OAS) program. This program is open to all employees with defined monthly contributions and the pension funds received are the result of accumulation and development in contributions. However, the JHT program also has the option to exercise defined benefits with employee contributions of 2% of wages and the employer contributing 3.7% of the monthly wages. Pension funds can be paid on a lump-sum basis or all at once and can also be paid monthly until the participant dies.

Act of Pension Fund in Indonesia

As a form of social protection to ensure that all Indonesian people can fulfill their basic needs in a proper manner, based on Law Number 24 of 2011 concerning Social Security Administering Bodies, BPJS Ketenagakerjaan is a legal entity established to administer social security programs in the form of: accident insurance, employment, life insurance, pension benefits, and pension benefits.

Based on Presidential Regulation Number 109 of 2013 concerning Staging of Social Security

Program Participation, the obligation to participate in the social security program organized by BPJS Ketenagakerjaan is still being implemented gradually, the pension security program is only required for large and medium scale employers. and it is not yet compulsory for small and micro scale employers. In addition, groups of workers from the informal sector (other than employers) are only required to participate in work accident and death insurance programs, and are not yet obliged to participate in the pension security program.

In addition to the limitations in terms of membership, the benefits offered by the BPJS Ketenagakerjaan pension program are also relatively small to provide adequate livelihood security for workers who are about to undergo retirement age, with pension fund contributions paid only 3% of the wages received by participants (Government Regulation Number 45 of 2015, 2015).

Literature Review

Financial literacy of pension fund in Indonesia

Financial literacy is the ability to process information related to the economy, and make financial decisions related to financial planning, wealth accumulation, loans, and pensions (Lusardi & Mitchell, 2014). Meanwhile, according to Taft et al. (2013), financial literacy is the ability to understand and analyze financial choices, plan for the future, and be able to respond appropriately to events related to finance.

The level of financial literacy is divided into two, namely the basic level and the advanced level (Lusardi and Mitchell, 2007). Basic financial literacy includes an understanding of the calculation of bank interest, compound interest, inflation, the value of money against time, and money illusion. Meanwhile, advanced financial literacy includes understanding the calculation of risk factors, differences in stocks and bonds, stock market functions.

The literacy rate for pension funds is 14.13% and the financial inclusion index for pension funds is 6.18% even though the financial inclusion index has reached 76.19% (Financial Services Authority, 2019). This figure shows that only 6 out of 100 Indonesians use pension fund products. The low index of financial literacy and inclusion shows that there are still few Indonesians who understand and are interested in utilizing pension fund products.

Related Literature factor affecting participant of pension fund

What are the factors that influence the planning / ownership of individual pension funds? Various empirical studies show that financial literacy has a significant effect on individual pension fund ownership. Nue et al. (2020) proved that financial literacy significantly affects individual retirement planning in China. Other literature shows that pension fund participation is influenced by individual characteristics such as the level of respondent's income, company size, worker motives, and years of service (Dumman, 2008; Hasan et al., 2007). Aside from using the Probit and Logit analysis approaches, the analysis method used to estimate the determining factors of planning / ownership of pension fund is a regression approach

Various studies have shown that financial literacy, individual characteristics, and technology can affect pension fund ownership. Lazuardi and Mitchell (2007) reveal that financial literacy and individual characteristics such as age, education level and income level have a positive influence on

pension fund planning in the United States. This same is evidenced by Onduko *et al.* (2015) in Kenya.

Sanderson *et al.* (2018) tried to develop factors that affect ownership of financial service products by including infrastructure aspects such as the internet and distance from the house. The results show that ownership of financial service products is positively influenced by financial literacy, age, income, education level, and internet connection. Meanwhile, the distance from the house to financial service facilities has a negative relationship.

Data and Method

Data source

The data used in this study is financial literacy and financial inclusion surveys conducted by the Financial Services Authority (OJK) in 2016 and 2019.

Method of Analysis

The factors that are thought to influence pension fund participation include individual characteristics such as gender, education level, income, type of work, understanding of pension funds and retirement planning design (Njuguna and Otsola, 2011). Estimation of the factors that influence ownership of the pension fund program can use the logit and probit models.

Linear Probability Models often refer to Logit analysis, which is a combination of Multiple Regression and Multiple Discriminant Analysis (MDA). This technique is similar to multiple regression analysis in one or more independent variables used to estimate single dependent variables (Hair *et al.*, 1992). The odds in the probit model are calculated as follows:

$$p = P[Z \leq \beta_1 + \beta_2 x_i] = \Phi(\beta_1 + \beta_2 x_i) \quad (1)$$

Where Φ is the probit function or cumulative distribution function used to calculate the normal probability density function $\phi(z)$

The probit model was first introduced by Chester Bliss in 1934. This model is a cumulative distribution function model that fits to explain the qualitative response of the binary dependent variable (binary response) (Intriligator *et al.*, 1996). The sample is calculated from one or two possibilities, namely the inclusion index or high and low literacy. The probit model used by Ibrahim and Bauer (2013) is as follows:

$$\Pr((Z = 1|w)) = \Phi(w'\alpha) \quad (2)$$

Pr = Probability of occurrence (P (1) = occurring; P (0) = not occurring)

Φ = Cumulative Distribution Function (*Cumulative Distribution Cumulative*)

α = Estimated parameter

The selection equations in this model are:

$$Z^* = X'\alpha + \epsilon_i \quad (3)$$

Where $\epsilon_i \sim N(0,1)$ and Y can be shown as indicators for hidden variables that are positive: ϵ

$$Z = \begin{cases} 1 & \text{if } Z^* > 0 \\ 0 & \text{is other} \end{cases} \quad (4)$$

To find out the factors that affect the level of participation in pension funds using probit and logit regression, it can be summarized in the following equation

$$Z^* = \alpha_0 + \beta_1 FLI_i + \beta_2 X_{3i} + \dots + \beta_S X_{Si} + v_i \quad (5)$$

Z^* = opportunity to participate in the program pension funds (1 = participant; 0 = non-participant)

$\alpha_0 \beta_S$ = estimated

parameters FLI =

Financial Literacy Index

$X_3 \dots X_S$ = other variable that affect public participation in pension funds (income level, savings ownership, insurance ownership, BPJS employment ownership, type of work, education level, gender, education level, investment aspects, financial technology aspects, etc.)

v = error term.

i = individual

Result and Discussion

Overview of Development of Pension Fund Participants in Indonesia

During the period of 2010 to 2018, number of pension fund participants have increased, even though in 2019 it experienced a slight decline (Figure 1).

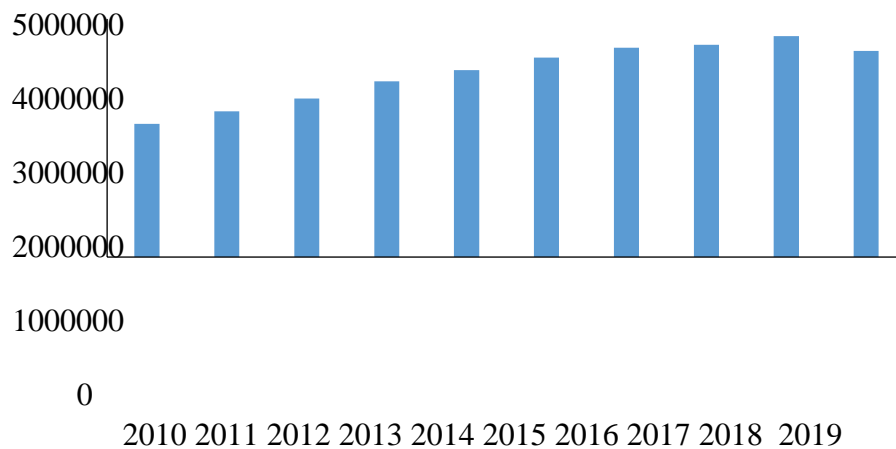


Figure 1. Number of Pension Fund Participants in Indonesia

Source: Financial Services Authority of Indonesia (2020)

Since pension funds in Indonesia are divided into 2 types; Defined Benefit Pension Fund and Defined Contribution. Figure 2 shows the number of participants of each type of pension fund. The number of participants in Indonesia is predominantly by the participants of Defined Contribution rather than the Defined Benefit. From 2010-2018, the number of Defined Benefit participants relatively stagnant, meanwhile, the number of Defined Contribution participants has been annually increased.

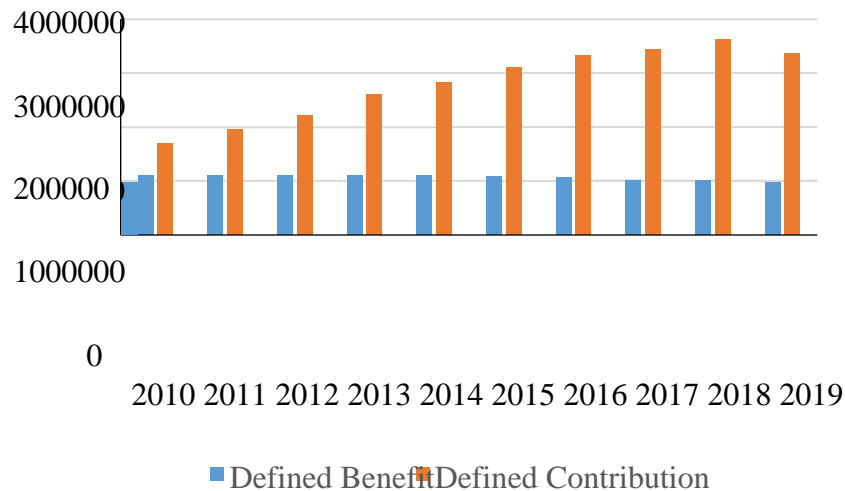


Figure 2. Development of Participants in Defined Contribution and Defined Benefit Indonesia
 Source: Financial Services Authority of Indonesia (2020), compiled

Factors affecting pension fund ownership in Indonesia

To analyze what factors affecting pension fund ownership in Indonesia, this study estimates 2 models; 1) pension fund participants in Indonesia in general; 2) pension fund participants by different type of pension fund. This study uses logit and probit regression models. Further explanation will be discussed in this chapter. Table 1 describes the factors determine pension fund ownership ingeneral.

Table 1. The Determining Factors for Pension Fund Participants in Indonesia

Dep Variable: Pension Fund Ownership Dummy = 1		
Variable	Logit (Ods Ratio)	Probit (Marginal Effect)
Financial_Literation_Index	1.74 ***	0.0113 ***
Income Level	1.12 ***	0.0024 ***
Dummy_Women	1.13	0.0024
Savings ownership dummy = 1	1.63 ***	0.0081 ***
Dummy of insurance_ account ownership = 1	7.72 ***	0.0404 ***
Ownership dummy bpjs_ketenagakerjaan = 1	2.02 ***	0.0142 ***
Java Island Dummy == 1	1.15 **	0.0022 **
Years of Education	1.02 **	0.0002
Type of work		
UMKM Entrepreneurs	1.42	0.0037
Big Entrepreneur	1.08	-0.0011
Private employees	1.34	0.0025

Government officials	9.59 ***	0.098 ***
Retired	2.34 ***	0.013 ***
Other Work	1.72 *	0.0069 *
Housewife	-0.17 ***	-0.0085 ***
Investment Aspects		
Deposit Ownership Dummy = 1	1.04	0.0012 *
Share Investment Ownership Dummy = 1	-0.47	-0.0139 *
Gold Investment ownership dummy = 1	1.39	0.0072
Financial Technology Aspects		
Dep Variable: Pension Fund Ownership Dummy = 1		
Variable	Logit (Ods Ratio)	Probit (Marginal Effect)
ATM User Dummy = 1	1.26 *	0.0025
EDC User Dummy = 1	-0.85	-0.0023
Phone Banking User Dummy = 1	-0.92	-0.0009
Internal Banking User Dummy = 1	1.03	0.0007
Dummy User Online Transaction = 1	1.02	0.0002
Dummy of financial services institutions agent users = 1	1.18	0.0041
Cons	-0.001 ***	
Number of obs	22453	22453
LR chi2 (13)	2635.73	2647.99
Prob> chi2	0.000	0.000
Pseudo R2	0.304	0.306

Information: *) p <10%; **) p <5%; ***) p <1% Source: Author's calculation

The results show that financial literacy is a significant factor affecting pension fund ownership for the probit and logit models. Individual characteristics explain that the level of income, years of education, place of residence, ownership of a savings account, ownership of insurance, and ownership of BPJS employment have a significant effect on ownership of pension funds. Based on the type of work, it shows that government employees, retirees, and other occupations have a positive influence on ownership of pension funds. Meanwhile, housewives have significantly influence pension fund ownership, with a negative relationship.

Based on the financial investment variables, it shows that no significant result in the logit model, but time deposit ownership and stock investment is significant at the 10 percent in the probit model. Individuals who have time deposits have probability to have pension funds. Individuals who invest in stock have negative relationship with ownership of pension funds. This shows that the individual prefers stock investment instruments over pension funds. In the aspect of financial technology, the factor affecting pension fund ownership is that ATM users are significant at the 10 percent. This shows that individuals who use ATMs have probability of having pension funds.

The next analysis (Table 2) is to analyze the influencing factors to the ownership of pension funds based on their types.

Table 2. The Determinant of Defined Benefit and Defined Contribution Participants

Variable	Dep Variable: DEFINED BENEFIT Pension Fund Ownership Dummy = 1		Dep Variable: DEFINED CONTRIBUTION Pension Fund Ownership Dummy = 1	
	Logit (Ods Ratio)	Probit (Marginal Effect)	Logit (Ods Ratio)	Probit (Marginal Effect)
Financial_Literation_Index	1.54 ***	0.0056 ***	1.33 ***	0.0032 ***
Income Level	1.09 ***	0.0012 ***	1.15 ***	0.0012 ***
Dummy_Women	1.01	0.00001	1.5 ***	0.0034 ***
Savings ownership dummy = 1	2.4 ***	0.008 ***	1.08	0.001
Dummy of insurance_ account ownership = 1	7.46 ***	0.0241 ***	7.64 ***	0.0181 ***
Dummy bpjs_ketenagakerjaan = 1	1.79 ***	0.0069 *	1.94 ***	0.0065 ***
Java Island Dummy == 1	1.46 ***	0.0038 ***	0.64 ***	0.0039 ***
Years of Education	1.04 ***	0.0002 *	1.02	0.00002
Type of work				
UMKM Entrepreneurs	1.35	0.0016	2.10	0.0036 *
Big Entrepreneur	1.29	0.0005	1.63	0.0011
Private employees	1.31	0.0013	2.21 *	0.0036 *
Government officials	14.22 ***	0.0954 ***	7.11 ***	0.0252 ***
Retired	2.36 **	0.0081 ***	3.01 **	0.0067 ***
Other Work	1.89 *	0.0054 **	2.08	0.0035

Variable	Dep Variable: DEFINED BENEFIT Pension Fund Ownership Dummy = 1		Dep Variable: DEFINED CONTRIBUTION Pension Fund Ownership Dummy = 1	
	Logit (Ods Ratio)	Probit (Marginal Effect)	Logit (Ods Ratio)	Probit (Marginal Effect)
Housewife	-0.08 **	-0.0054 **	-0.46	-0.0019
Investment Instruments				
Deposit Ownership Dummy = 1	1.11	0.0016	1	0.0002
Share Investment Ownership Dummy = 1	-0.15 *	-0.0213	-0.68	-0.0019
Gold Investment ownership dummy = 1	2.15 ***	0.0096 **	0.44 *	0.008 *
Financial Technology Instruments				
ATM User Dummy = 1	1.55 ^	0.0024	1.74 ^^	0.0028 **
EDC User Dummy = 1	-0.79 *	-0.0019	-0.84	-0.0013
Phone Banking User Dummy = 1	0.99	0.0004	0.92	0.0006
Internal Banking User Dummy = 1	0.96	0.0004	1.48 ***	0.0036 ***

Dummy User Online Transaction = 1	1.06	0.0007	1.08	0.0004
Dummy of financial services institutions agent users = 1	1.01	0.0003	1.3	0.0031 **
Cons	0.0005 ***		0.0005 ***	
Number of obs	22453	22453	22453	22453
LR chi2 (13)	2329.05	2326.67	947.2	961.44
Prob> chi2	0.000	0.000	0.000	0.000
Pseudo R2	0.3282	0.3279	0.2239	0.2273

Information: *) p < 10%; **) p < 5%;

***) p < 1% Source: Author's

Process

Based on the table above, it shows that financial literacy significantly affects pension fund ownership in the both types of pension fund, the Defined Contribution and the Defined Benefit.

Individual factors that significantly influence Defined Benefit pension fund ownership are the same variables as the previous model in general; income level, years of education, residence, ownership of a savings account, ownership of insurance, and ownership of BPJS employment. The difference is in the type of Defined Contribution, the women has a significant effect on pension fund ownership.

The factors that influence pension fund ownership based on the type of work show that Defined Benefit are not different from pension fund ownership in general. Meanwhile, the Defined Contribution shows that jobs that have a greater chance of having pension funds are MSME Entrepreneurs, Private Employees, Government Employees, and Retirees.

The financial investment aspect in the Defined Benefit type shows that ownership of stock investment and investment in gold has a significant effect on ownership of pension funds. Whereas in the Defined Contribution, only gold investment has a significant effect on pension fund ownership. The financial technology aspect shows the difference between Defined Benefit and Defined Contribution products. Types of Defined Benefit pension funds, the factors that influence pension fund ownership are ATM and EDC users, while in the type of Defined Contribution the factors that affect pension fund ownership are ATM users, internet banking users, and users of financial services institutions agents such as BRI link.

Conclusion

The results show that the development of pension fund participants in Indonesia has increased starting 2010. Based on the types of pension funds in Indonesia, it shows that the type of Defined Contribution has a larger number of participants than the Defined Benefit. The growth of Defined Benefit pension fund participants is relatively stagnant, while Defined Contribution has increased every year.

In general, there are four influencing factors for pension fund ownership in Indonesia; financial literacy, individual characteristics (income level, years of education, place of residence, ownership of a savings account, ownership of insurance, and ownership of BPJS employment, government employees, retirees, housewives), financial investment aspects (time deposit ownership, stock investment), and technology financial aspects (ATM users). If the pension fund is differentiated by types, the factors affecting the participation of the Defined Contribution pension fund are relatively more varied than the Defined Benefit.

Since the most important factor in influencing pension fund ownership is improvement of financial literacy, it is required to increase the awareness of people to independently participate in pension fund program.

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