FINANCIAL LITERACY AND PENSION PLANNING OF MONGOLIAN HERDERS

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Abstract: *Pension planning is an internationally accepted tool for income substitution and poverty reduction in old age. The livestock sector is a traditional economic sector that still plays an essential role in the culture and economics of Mongolia. Herders account for nearly 24.5 percent of the total workforce. Pension income is the second monetary income source for herders. However, as of 2017, 32 percent of herder households are in poverty, and only 24 percent of herders participated in the social insurance program. This paper investigates the pension planning of a survey among 350 herder households in Mongolia in 2017. The study aims to pay attention to herder's pension awareness, knowledge, participation in pension, and to identify factors that influence pension participation. The research results indicate that less than half of total herders make financial plans for their retirement, although only 27 percent of participants pay social insurance fees regularly in various amounts. Social insurance fees paid by the herders are positively affected by education, age, and social insurance coverage, whereas the size of the loan has a negative impact. Our conclusion highlighted that improving herders' motivation, knowledge about retirement and basic financial literacy are essential. Policymakers and local government agencies need to develop policy tools to motivate the young herder's pension participation to break out a poverty cycle.*

Keywords: *financial behavior; financial literacy; pension planning; herders Mongolia.*

JEL Classification: *J43; G40; D14.*

1. Introduction

The agricultural sector is one of the primary industries in Mongolia that providing 10.6% of GDP after the mining sector, 8.4% of export earnings. Livestock sub-sector remains dominant within the agriculture sector, making up for 88% of the total agricultural output in 2017(NSO, 2018b). The number of livestock is increasing and has reached 66.2 million or 110.8 million heads of animals in sheep units in 2017. As the animal is the primary income source of 169.7 thousand herder households (303.6 thousand herders), livestock herd sizes regard as an approximate measure of the wealth of herding households in Mongolia. Herder households with less than

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200 livestock as poor herders make up 43% of the total number of herder households, but the size of their herd only accounts for 12% in terms of the total number of livestock in Mongolia (FAO and MoFALI, 2018). Herder households are slightly more affected by poverty than in other types of families. 28.8 percent of households without livestock are in poverty; in comparison, 31.9 percent of herder households are in poverty (NSO, 2018a). From the total household income of Mongolian herder households, 75.9% is various monetary income, which further consists of 41.3% of agriculture, 17.1% from pension and benefit, 11.2% from wages (NSO, 2018a). Moreover, researchers are concerned that the number of young herders is decreasing. According to statistical data, the number of herders aged between 15-34 is decreasing, whereas the number aged 35 and more are increasing (NSO, 2018a).

Mongolia introduced a state (public) pension system since 1942, which consists of mandatory and voluntary contributor schemes. The Mongolian Parliament made amendments into the Pension and Benefits provided by the Social Insurance Fund law in 2017. Also, they approved the Mongolian act of reimbursing pension insurance for herders and self-employers in 2013 and 2017 to improve the participation of pensioning. It dedicates an opportunity to herders repaying the pension insurance fee of the unpaid years in minimum wage level (Mongolian government sets the minimum wage level in every two years, as 240000 MNT/ 91.2USD in 2017). Notably, herders retiring age decreased by five years, each on male and female and set to 50 for women and 55 for men. Reference income declared voluntarily by herders, between the minimum wage and ten times the minimum wage level. Eligibility years of service: not less than 20 years of contribution to be entitled to a full old-age pension; and at least 10–19 years of participation for partial retirement. Replacement rate 45 percent of the monthly average wage of the highest continuing seven years' income and extra to 20 years 1.5 percent per each additional year. One herding year equals one year multiplied by 1.2 coefficient (Parliament, 1994, 1997; Mongolian Parliament, 2017). Consequently, herders can have an average of 30-40 working years and further a higher pension income (Ganchimeg, 2018).

As of 2017, at a national average, only 23.9 percent of total herders covered by social insurance. This coverage number is four times higher compared to 6 percent in 2000. Notably, 13 percent of herders pay the social insurance fee in 2017(NSO, 2018b). The average pension amount is 282.7 thousand tugriks or 107.4 USD. The amount is low compared to the national average of 378 thousand tugriks or 143.6 USD.

Mongolian herders' retirement age becomes 50 for females and 55 for males; it is considerably lower than the average of international average retirement age 64.7 for males and 64.3 females (Pension, 2019). Ninety more percent of the herders pay minimum level social insurance fees. If they pay up to 10 times from the minimum fee level, they can increase their monthly pension amount. Herders and self-employers have only the opportunity to increase pension income 2-5 times higher than the average pension level if they grow the monthly insurance fee (Ganchimeg, 2018).

Retirement is an event with profound personal, social, and economic consequences (Aaron, 2010). Saving for old age allows individuals to transfer any excess income

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gained of their earning years to the corresponding dry times of old age (Rusconi, 2009). Old-age pension systems have two objectives: income replacement and poverty prevention (Dethier *et al.*, 2011). Financial literacy in shaping retirement planning plays an important role (Lusardi and Mitchell, 2011). Financial literacy tied tightly to retirement planning. Individuals' financial literacy levels are different, and several factors do affect financial literacy.

Although many studies have focused on financial literacy, pension planning, and consumer behavior, there is no research on Mongolian herders' behavior and participation for retirement. Thus, reducing rural poverty through increasing pension participation and pension income would contribute to the Sustainable Development Goals of the United Nations: no poverty in 2030.

The research objectives of this paper are (1) to survey and analyze herders' pension knowledge, motivation, and attitude to participation in the pension, (2) to identify factors that influence pension participation.

The structure of the paper is as follows: Section two of this paper describes the materials and methods, including theoretical framework, model specification, data collection, and descriptive statistics. The third section presents data analysis and results. The last part of the paper contains the discussion and the main conclusions.

2. Materials and Methods

2.1. Theoretical Framework
Consumer financial behavior studies interlinked with consumer research in marketing, behavioral economics, and behavioral finance. Pension planning is one of the areas of the consumer financial behavior. People do not like to think about old age, sickness, lack of working power, lack of motivation, getting excluded from the working market, a decrease in social status, and their fall in self-esteem (Aaron, 2010; Raaij, 2014, 2016).

Pension plans are also considered to be problematic to understand, dependent on a lot of political, societal, and thus uncertain variables (Van Rooij, M., A. Lusardi, 2011; Kadoya and Khan, 2019). Retirement is an event with profound personal, social, and economic consequences (Aaron, 2010). Saving for old age allows individuals to transfer any excess income gained of their earning years to the corresponding dry times of old age (Rusconi, 2009). People who plan for retirement do accumulate more retirement savings. However, Individuals often have limited financial knowledge and know little about the characteristics of their public and occupational pension plans or how much to expect in retirement benefits (Holzmann Edward, 2006). Financial literacy in shaping retirement planning plays an important role (Lusardi and Mitchell, 2011). Many people are woefully unaware of basic economics and finance, shortfalls that may lead them to make severe and often irreversible mistakes. Kadoya and Khan (2016) indicated that the demographic factors of gender, age, and education; the socio-economic factors of income and occupation; and the psychological factor of perceptions of the future significantly affect the level of financial literacy. Individuals' financial literacy levels are different, and several factors affect it.

According to Raaij (2016) and Kadoya and Khan (2019), socio, economic, demographic factors impact pension awareness, pension knowledge, expected lifestyle, and pension saving. Awareness and motivation are the starting points for pension knowledge and pension saving. Motivation, knowledge, individual's behavior to pension planning, self-control and self-regulation, time preference, procrastination, and expectations about their future value of pension plans, all these combined make up the pension knowledge and impact the decision. Many people have insufficient pension knowledge. Knowledge should be consecutive steps such as knowing the pension income, whether this income sufficient after retirement and if not sufficient how to increase retirement income. The following step is life cycle events like getting a job, buying a house, having a kid, grown-up, getting fired, getting divorced or moving, become the prerequisite for pension saving. Life changes continuously; people make changes in their financial plan; these actions will define what their pension saving would be like (Figure1).
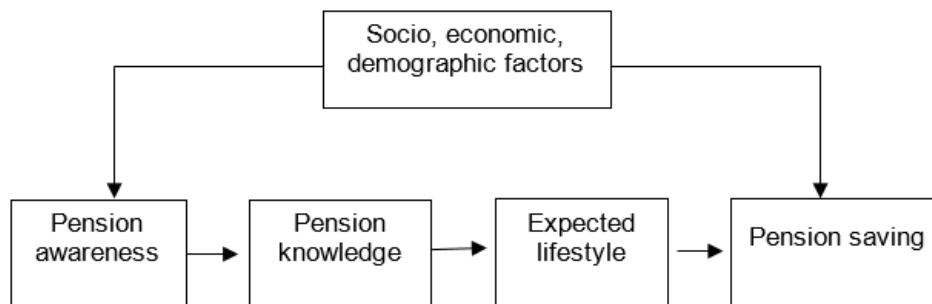

Figure 1. Relationships between awareness, pension knowledge (literacy), expected lifestyle and pension saving
Source: (based on the Van Raaij, 2016, Kadoya and Khan, 2016)

2.2. Study Area
The survey was conducted before the amendment for Mongolian law on Pension and Benefits provided by the Social Insurance Fund in 2017 enforced.
The primary data selected from the Socio-economic Baseline Study of herder Households. Data collected with a nationwide survey between July to August in 2017 by Mongolian Marketing Consulting Group funded by Green gold and Animal health project of Swiss Development Cooperation. The study applied two-stage stratified sampling. A number of animals and herder households at *soum* (the second administration unit of Mongolia (district)) and the *bag* level were taken from the annual animal census-2015 of National Statistical Office Mongolia. Herder households are nomadic; thus, we excluded the 330 *soums* and 21 *aimag (*The first level of the administrative unit of Mongolia (province)*)* centers. The first stage or soum sampling considered the representation of every zone, the number of herder households (1-499 and 500 more), and distance from the *aimag* centers (1-199km and 200km more). According to these indicators, every soum (total 309 *soums*) has divided into stratum. One *soum* per stratum was selected: *Khangai region-*Arkhangai

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aimag-Ikhtamir, Battsengel, Tsakhir *soum*, Bayankhongor *aimag*- Bayanlig, Bayantsagaan *soum*, Khuvsgul aimag- Alag-Erdene, Arbulag *soum*; Uvurkhangai aimag-Bogd soum; *Central region*- Tuv aimag- Undurshireet, Buren, Delgerkhaan *soum*, Umnugobi *aimag*-Mandal-Ovoo soum; *Western region*- Zavkhan aimag-Erdenekhairkhan soum, Khovd- Chandmani soum; *Eastern region*- Dornod aimag-Tsagaan-Ovoo soum. Thus, 15 *soums* of 9 *aimags* have selected as the survey respondents. We determined the number of survey respondent units from the chosen *soums* by equal distribution method (350:15=23). As a result, we involved 23-24 households per selected soum. Herder households were selected from 10 different livestock groups numbers: up to 10, 11-30, 31-50, 51-100, 101-200, 201-500, 501-999, 1000-1499, 1500-2000 and 2000 above at each *soum*. Finally, a total of 350 herder households were involved in surveying. One herder household represented 410 herder households on average (Figure 2).

Figure 2. Location of the study area

2.3. Indicator Measurement Design

In order to evaluate the herders' pension knowledge, motivation, and attitude to participation to the pension and identify factors the study based on Raaij (2014, 2016) and also draws on other relevant studies(Van Rooij, Lusardi and Alessie, 2009; Aaron, 2010; Lusardi and Mitchell, 2011; Van Rooij, M., A. Lusardi, 2011). Based on the relationship between financial behaviour, financial literacy and pension planning, and data availability, we identified ten indicators in total (Table 1).

Our expectation of the variable age is positive for the social insurance fee payment. In the model, we concerned to examine how this coverage rate related to herder's willingness to pay the social insurance fee. Our expectation of this variable is positive. Respondents questioned how many times they were present *bag (*Smallest administration unit (subdistrict) of Mongolia*)* meeting. *Bag* meeting explores information, awareness for the fellow herders; therefore, expectation from this variable is herders with more motivation and knowledge would pay more rather than herders with less information.

Table 1. Operationalization and expected effects of explanatory variables

Variables	Expected impact	Implication of variables	Scholarly references
Demographic and social variables			
Sex	+	Sex of respondent. Differences between sex in financial literacy are statistically significant.	(Raaij, 2014) (Arellano, Cámara and Tuesta, 2018)
Age	+	Age of respondent. Pension planning depends on age.	(Raaij, 2014) (Caroline E. van Dullemen and Jeanne G. M. de Bruijn, 2015)
Education level	+	Education as a measure of financial literacy. From illiterate =0 to university level=6.	(Lusardi and Mitchell, 2011) (Van Rooij, Lusardi and Alessie, 2009) (Dimitris Christelis *et al.*, 2010), (Raaij, 2016)
Social-Insurance coverage	+	Herders who paid Social insurance fees in some years. Most of the herders caught the opportunity to recompensate the Social insurance fees in 2013.	(Madrian and Shea, 2001)
Bag meeting	+ / -	Official source of information and knowledge in the first level of the administrative unit of Mongolia. The average frequency of *bag* meetings in the countryside is 4.	(Lusardi, 2004), (Clark and d'Ambrosio,2008), (Bernheim and Garrett, 2003), (Raaij, 2016) (Duflo and Saez, 2003) (Clark and d'Ambrosio, 2008)
Economic variables			
Livestock	+	The number of registered livestock at the end of 2016, Cattle, horses, camel, sheep, and goats are the main stock types.	(Raaij, 2016)
Total revenue	+	Total household revenue includes all different income sources.	(Raaij, 2016)
Total cost	-	Total annual household cost. If household cost is higher than the income, they cannot participate in Social insurance.	
Loan amount	-	Received a loan in 2016. Households can borrow money from friends and relatives and get credit from banks and non-banking financial institutions.	(Lusardi and Tufano, 2009)
Size of savings	+	Household saving amount in a bank in 2016.	(Bernheim and Garrett, 2003)

Source: Authors.

Five variables selected to show the economic capability of herders. The number of livestock, total income, savings are expected to have a positive relationship with the dependent variable, while total cost and loan would have a negative correlation. Since, social insurance payment and credit are cost items of herders, that are competitive with consumption cost. Therefore, herders with higher expenditure would postpone paying a voluntary social insurance fee. The number of livestock is an approximate measure of herders' livelihood. In this connection, there was multicollinearity founded between the number of livestock and the total income of herder household. After the test evaluation, the variable- total income was included in the model.

2.4. Model Specification and Test

Using the dataset described in the next section, the following relationship is estimated:

$$Y_i = f(A_i, B_i) + \varepsilon_i, for\ i = 1, \ldots 350$$

(1)

Where:

Y_i =Social insurance fee paid by a herder i voluntarily, by money term;
- A_i = Set demographic and social variables of herder i;
- B_i = Set of economic variables for herder i;
- ε_i = Error term with standard properties

The dependent variable is a continuous variable. Herders are as a voluntary contributor to the Social insurance fund; their social insurance paid an amount, and paying frequencies are different. A regression model estimated using SPSS through standard econometrics procedures to determine the above model (Andy, 2005; Marno, 2008)

2.5. Descriptive Statistics

Table 2 provides the descriptive statistics of the variables selected for the model, and the texts the table explained the current state of each explanatory variable.

The amount of paid pension fees varies over the sample. Consequently, we evaluated the relationship between the amount paid by the herders (as a financial behavioral variable) and other explanatory variables representing their demographic, social, and economic value.

Herders paid an average of 8 USD, which is far lower than the maximum amount paid by some herders (Table 2). According to the survey data, only two herders paid more than 300 thousand MNT or 120 USD, five herders paid between 100-200 thousand MNT or 40-76 USD, and more than 90 percent of interviewed herders paid less than 100 thousand MNT or 40 USD.

Table 2. Descriptive statistics of the dependent and independent variables

	Unit	N	Minimum	Maximum	Mean	Std. Deviation
Y	USD	350	0	126.65	8.38	14.27
A_i: Demographic and social variables						
Sex	1 or 0	350	0	1	0.93	0.248
Age	Integer	350	21	82	44.79	12.155
Education level	1 to 6	350	1	6	2.98	1.049
Social Insurance coverage	Y/N	350	0	1	0.42	0.495
Bag meeting	Times	350	0	7	1.79	1.446
B_i: Economic variables						
Livestock	Heads	350	6	3059	501.59	492.614
Total revenue	USD	350	37.99	56 504.56	5125.72	6021.16
Total cost	USD	350	100.68	20 096.25	2039.34	2361.72
Loan amount	USD	288	0.00	11 398.18	1642.51	1381.20
Size of savings	USD	149	0.00	28 495.44	1425.95	3382.41

Source: Authors.

2.5.1. Demographic and Social Variables
Almost all (93%) respondents were male; therefore, variable *Sex* dropped out from the model, which has not shown the gender differentiation. The oldest respondent was 82 years old, and the youngest 21 years old. In the estimation, we exclude pensioned people who are older than 60 years old for males, 55 years old for females. Variable *education* coded 1 refers to no-education, and 6 is University degree. The average education level of respondents was secondary education (6-9 years of schooling). Variable *social insurance coverage* is a dummy variable that indicated whether or not a respondent has social insurance coverage in any form. Hence, 42 percent of the respondent has social insurance coverage, whereas 27 percent of participants paid the social insurance fee.

2.5.2. Economic variables
The participating herders in the research were chosen using stratified sampling, so the herder with the fewest livestock has 6, whereas the herder with the most livestock has 3059. An average herder household has 500 head of livestock. When calculating their income, we included in the questionnaire other types of income sources. The average annual revenue of a herder household is 5125 USD, while the poorest herder household has an income of 38 USD. As poor herder households, they are unable to pay for social insurance. They consume some basics food like meat and milk products from their farm free of charge. A herder household's expenditure varies depending on their number of livestock and other factors, the lowest cost is 100 USD, and the average is 2040 USD. At the time of the questionnaire, 288 households had

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taken loans, and the average amount of loans was 1600 USD. The number of families with savings was 149.

3. Results

The model presented in the previous section explains the dependent variable from several explanatory variables at herders' level. Estimation techniques applied before in similar studies include logit regression and the analytical hierarchy logistic model, where the dependent variable is a choice variable. In our case, our dependent variable is a continues variable; therefore, a linear regression model selected as more suitable for our study after testing the functional form and distribution of the dataset (Andy, 2005; Cameron, 2009).
In table 3 clarifies that, in terms of age, people getting older concerns more about a pension — aged herders' participation in the Social insurance payment higher than the younger herders.

Table 3. Regression results

Variables	Unstandardized Coefficients		Standardized Coefficients	t statistics
	B	Std. Error	Beta	
(Y: Payment of Social Insurance Fee)				
A_j: Demographic and social variables				
Age			.258	2.604**
Education level	5.888	2.164	.372	2.721**
Social insurance coverage	34.542	7.835	.448	4.409**
Bag meeting	-.283	2.215	-.014	-.128
B_i: Economic variables				
Total revenue	.170	.204	.093	.837
Total cost	.483	.530	.099	.911
Loan amount	-18.018	9.466	-.209	-1.903*
Size of savings	-.442	.692	-.051	-.639
R Square				.499
F statistics (.000)				14.962
Durbin-Watson				2.105

Notes: *, ** indicate significant at 5%, and 1% level respectively.
Source: Authors.

Educated people understand more about the importance of future investment; therefore, they willing to pay more to their social insurance fee as expected. People who have received previous opportunities to recompensate their social insurance payments have more understanding and desire to pay the social insurance fee. Loan as a competitive consumption or investment for herders, people who have more credit, would have less chance to pay higher social insurance payments.

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Bag meetings, households' total income, and households' total cost, savings are contrary to the expectations not significant.

4. Discussion

Pension planning is vital for herder's current consumption cost and future income source. An essential contribution of our study on anti-poverty policy study is a quantitative analysis of the Mongolian herders' participation in pension. We found that herders have insufficient knowledge and understanding of retirement. It can be seen from the percentage of people involved in pension insurance and that 90 percent of them pay the lowest amount fee. Moreover, herders' behavior to participation in the pension is less than 30 percent in Mongolia. The result is similar to Raaij's (2016) research where people pay too much attention to their career and family, thus, and they do not pay enough attention to their life after retirement.

Age is a key variable for participation in the old age pension Raaij (2014, 2016). Worrying about their retirement income is not something for young people. Our research correlates with the notion that people tend to think about their future and look to make changes in their financial state after they cross the 40-year-old mark.

According to the research of Van Rooij, M., A. Lusardi (2011), financial literacy affects financial decision-making. One of the most important financial decisions in pension saving. Our results do not match with the study of Van Rooij, M., A. Lusardi (2011) that in terms of financial education, age correlates with an inverted U-shaped pattern, meaning that young and older adults have inadequate financial training. A possible explanation would be because herders start work from the early age of 16 and after becoming herders they do not have to gain further systematic knowledge.

The next question is why people fail to plan; planning requires making calculations, many of which are facilitated by financial literacy. Lusardi and Tufano (2009) found that low literacy individuals are more likely to carry high-cost debt. Herders facing financial difficulties get a loan (mainly for consumption) from the financial institutions, i.e., credit is a competitive situation factor for pension fees. Our research results show those who have higher levels of education tend to have pension while those with loans fell less likely to have a pension. It is essential to develop various channels to increase herders' alternative income sources. Within the scope of the literature review we researched, in terms of social insurance coverage there was no research done on whether repaying the insurance fee had positive or negative effects on receiving pension in the future. Since pension saving is more of an individual's responsibility, there is evidence showing that if voluntary social insurance changes to mandatory, then pension coverage can be increased up to 90 percent(Raaij, 2016).

The variable of *bag* meeting was different from our expectations. Herders officially get information and knowledge from *bag* meetings. Therefore, we expect that if participation in *bag* meetings were to rise, the number of people covered by pension would increase. The reason that our results from the research came insignificant maybe because *bag* meeting participation was low, and providing information related to retirement is insufficient. Research results Clark and d'Ambrosio (2008) show that even if there were seminars that provided information, there was not that much

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progress. In response to the workshops, the proportion of participants who changed either of their retirement goals is relatively small.

5. Conclusion

Herders' livelihoods and their income is a crucial issue of development researchers as the livestock sector is a dominant economic sector of Mongolia. Pension is one of the internationally accepted terms that increase people's income and eradicates poverty. However, herders are a voluntary contributor to the social insurance fund. Herders' voluntary participation in pension needs to improve. While according to international examples, the retirement age is rising (Raaij, 2016), the retirement age for herders in Mongolia has been decreased by five years. Following this, they need to receive information on necessary financing and the benefits of pension savings from a young age. Therefore, policy-makers and government agencies pay attention to educate herders should be one of the tools to reduce herder's poverty. Giving awareness will extend the range of herders' pension participation, increase cash income in the long run, and reduce rural poverty. Thus, improving herders' knowledge and awareness on a pension is essential to set good behavior concerning pension participation.

6. Acknowledgment

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