Payment Persistence of Participants in Turkish Private Pension Scheme and Gender Differences

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Abstract

By considering the gender differences, this paper investigates the impacts of socioeconomic and demographic attributes on the persistence of individuals' payments to their own private pension schemes. With separating the individuals according to their genders, we study totally 6,025 participants from 2004 to 2012. For men, it is found that amount of payment, age, marital status, education, being located in the industrial and financial center of Turkey, higher risk tolerance and total period remained in the system are all positively associated with the likelihood of being a persistent payer. For women, the findings for all the attributes align to those for men except for the marital status and being located in the industrial and financial center of Turkey. Overall, our results are plausible for financial institutions and policy makers that are typically sensitive to the payment persistence of the participants to the private pension schemes.

Keywords: private pension, payment persistence, gender, investment, Turkey

1. Introduction

There is a worldwide trend towards defined contribution savings plan as an alternative and/or complement to the public pension systems. This is mainly due to aging of population in a global scale and thus worries over the replacement rate for the sustainability of defined benefit plans. Turkey gave a head start to the private pension scheme in 2003 by also maintaining its government pension mechanism. The purposes of the initiation of the private pension system is not only to provide additional income to individuals but also to surge national savings into long term investments and thus deepen domestic financial markets (Elveren, 2013), also reduce the predominant share of foreign institutional investors in the stock market capitalization of Turkey (Akın, 2012).

The voluntary saving scheme in Turkey is neither a form of employment-based profit sharing arrangement nor an employer-sponsored pension. The investor has a choice regarding the type of assets in which the accumulation is invested and can easily find out its value at any time. Participants may pay any amount of contribution and investment funds managed by individual pension participants allow them to consider a range of investment strategies, selecting portfolios suited to their time horizon and risk tolerance.

Payment after the due date or a missing payment is a common problem for all private pension plans in Turkey. Penalty fee or interest payments are worldwide applications to enforce participants to ensure payment persistency. However, the problem is expanding, mainly due to application of very low penalties for late payments by the Turkish legislation. The report of Pension Monitoring Center of Turkey indicates that this leads to a significant loss for not only system participants but also for the national economy (Individual Pension System Progress Report of Turkey, 2010).

The aim of this study is to investigate the impacts of demographic and socioeconomic attributes on the payment persistency of participants to a private pension scheme in Turkey. In other words, we analyze the influence of the demographic and socioeconomic factors on the discrepancy between declared payments on the pension contract and actual payments of the individuals. The socioeconomic attributes and demographics of private pension subscribers raise important questions for public policy, particularly in the light of the recent trend toward self-directed pension accounts. With the better understanding of the impact of these attributes on the observed payment patterns, interventions can be more effectively designed for overall financial well-being of citizens and

capital allocation to domestic financial markets can be better managed. Furthermore, the results for Turkey provide generalizability for comparable emerging markets with recent attempts of institutionalizing private pension schemes.

To our knowledge, this is the first study on the payment persistency of the private pension scheme participants for Turkey. Previously, Kayam, Parkin, and Celiktopuz (2013) have shown the impacts of demographic factors on a participant's premature departure from the Turkish private pension scheme. In a similar vein, for Turkey, Arslan and Karan (2010) and Kucuktalasli, Arslan-Ayaydin and Karan (2012) highlight the importance of the impact of demographic and socioeconomic factors on consumer credit risks.

The second unique contribution of this study is to look at gender differences in the participant's persistence in payments to individual private pension schemes. By covering a database for the year 2004, Elveren and Hsu (2007) and Elveren (2008) were the first to study the gender dimension of social security in Turkey.

The remainder of this paper is as follows; the following section explains the motivation of the study and the third section explains the database and methodology. In the fourth section we present the results and section five concludes the paper.

2. Motivation and Literature Review

While still maintaining its government pension system, Turkey puts a serious effort on promoting the individuals to the private pension scheme. Reduction in real interest rates, coming down from almost 30% in the immediate aftermath of the crisis to single digits to date enhances the attractiveness of the private pension scheme as a saving alternative. The participants of this scheme are able to retire at the age of 56 with a minimum participation of period of ten years. After then, they are entitled either to receive a lump sum payment on retirement or to take their total payment in the form of an annuity. The pension benefits depend mainly on contributions and their investment returns. Investments of participants are not taxed during the contribution period, however there are tax implementations for preventing them from opting out of the system before the vesting period. The total contribution in the system has amounted to 15 billion USD as of 2014 (Individual Pension System Progress Report of Turkey, 2014).

Turkish private pensions system has experienced notable growth right after the introduction of new incentives in 2011 to boost domestic savings. The new pension plan replaces the previous tax-deduction structure and encourages participants to make higher contributions to the system. The most noticeable improvement of the plan is that, the government matches 25% of individual contributions up to a gross monthly salary of about 500 USD, which is the minimum salary in Turkey. Meanwhile the regulatory authority coerces the pension companies to decrease their management fees and motivates new entrants to the sector to enhance the market competition.

In one of the notable studies, Smith (2006) investigate the payment persistency of individual pension plan participants in United Kingdom. The results of this study suggest that payment persistency is significantly related with the gender, earnings and income level of the participants. She concludes that participants with low income level struggle to match the pension plan payments even in the absence of income shocks.

It is plausible to focus on gender differences in payment persistence for the private pension scheme in Turkey. The savings of women typically have to be spread over a longer period of time since women live longer on average than men. Besides they must meet higher expenditures at the later stages of their lives since they experience more chronic health problems as they age. Therefore, women are more vulnerable than men to poverty in their older age. Moreover, substantial proportion of female employment in developing countries is in the form of short-term labor contract and casual, part-time work or home-based work (Sabates-Wheeler & Kabeer, 2003). Generally, state perpetuates the male dominance over women through gender biased social polices (Quadogno & Forbes, 1995). Similarly, Elveren (2013) defines the pension system in Turkey as "basing on a male bread-winner model where women are defined extensively as dependents". Despite relevant improvements in the Civil Code, the Labor Law and the Penal Code in early 2000's, Turkey's social security system does not cover the majority of women. Armed with these, women in Turkey need to accumulate more funds to independent pension entitlements. In the same vein, Romer (2001) indicates that greater the uncertainty about future income, the greater the saving. All together, we expect women to be more meticulous in payment patterns than men. However, it should also be taken in to account that, by covering the payments in 2004, Elveren and Hsu (2007) posit that in Turkey on the whole, women contribute less to their pension scheme than male mainly because women work fewer full time years than men. Again, for the year 2004, Elveren (2008) find for Turkey that relative to men, women receive lower pension benefits in a private pension system due to gendered division of labor in Turkey leading to lower earnings and shorter working period in the labor market. It

should be underlined that according to the OECD statistics, Turkey has by far the lowest women's employment rate at 29.8% as of 2014.

Currently in Turkey, the portion of defined benefit system has been shrinking in overall retirement fund allocation. Therefore, a person's well-being in retirement tends to depend more heavily on their attitudes toward risk and the impact of those attitudes on investment decisions. Therefore, we investigate the role played by the risk level of invested funds in the pension scheme on the payment persistence. We predict that as the level of risk in investments increase, payments become more persistent.

The argument on risk can also be attributable to gender differences as well. Charness and Gneezy (2012) show that women invest less and appear to be more financially risk averse than men. Similarly, women exhibit greater relative risk aversion in their allocation of wealth into defined contribution pension assets (Bajtelsmit, Bernasek, & Jianakoplos, 1999). Therefore, we are the first to investigate if the riskiness of investment portfolios has any role on payment persistence.

Kayam et al. (2013) report for Turkey that education level has a positive impact on not leaving the private pension scheme prematurely. Similarly, Van Rijckeghem and Ucer (2009) show for Turkey that as the education level increases, the savings rate rise as well. Moreover, in Turkey the education level is likely to improve the income-expense balance of households. Lastly, by studying the consumer credits in Turkey, Kucuktalasli et al. (2012) conclude that education has an increasing role in the likelihood of being a low-credit-risk customer given that they have more disciplined attitudes towards household expenditures. Consequently, we expect education to be positively associated with payment persistence for both genders.

Arslan and Karan (2009) find that in Turkey as the individuals age the eligibility of a household for consumer credit falls. Intuitively we expect the opposite for the persistence of private pension payments given that as the age of the individuals rise their payments become more persistent since they approach to their actual retirements.

While investigating role of demographics on the payment persistence of individuals, it is necessary to consider from which region of Turkey the participant is from (Note 1). The participants from the Eastern part of Turkey are most likely to leave individual pension scheme before retirement (Kayam et al., 2013). In terms of gender differences, urbanization plays an important role in the decrease of female labor participation, which is likely to have an effect on payment persistence of women. We expect the persistence to payment improve as the individuals live in urban areas.

The first study on the impact of marital status on private pension savings belongs to Johanisson (2008) who conduct analyses on the sample for Sweden. The author stresses that higher savings by married people is caused by the economic security tied to marital status. For this reason, married people allocate more savings to their private pension schemes. For the finding of higher savings by married women, the author assumes that married women usually are active in the labor market during a shorter period of time than married men because married men and women traditionally take different roles in both the labor market and in the family where men specialize in market production while women specialize in home production. Therefore, we expect a positive impact of being married on the payment persistence. We further posit that this positive impact is more pronounced for women because transferring parts of the household income to the wife's tax-deferred pension account becomes more important in a household.

3. Data and Methodology

The data is obtained from the one of the largest private pension firm of Turkey, *Anadolu Hayat Emeklilik* (AHE). The data is obtained from the firm by clustered sampling methodology. The original dataset includes several spreadsheets including demographic variables, payment history and also other information about the contract details. In the first step, we combine all of these spreadsheets to reach a final data set which includes all of the required information about the contract and contract holder. However, there are many missing values in the data set. Therefore, as a final step we delete the observation if it has any missing data related with any of the variables used in the analysis. Our final sample is a total of 6,025 customers having complete information about both demographic and socio-economics factors. The total number of male participants is 3,881, while the number of female participants is 2,144. The data for our analyses covers the payments made between January 31, 2004 and September 30, 2012.

We use logistic regressions to conduct our analyses which is formulated in Equation (1). In the equation, p represents the probability of an outcome, β_0 represent the constant term and β_1 is expected change in the log odds in response to one unit change in X_k which represents the set of independent variables. Our estimations are based on dummy variables differentiated as those taking a value of one if they are persistent payers and those

taking a value of zero if otherwise. We are able to access both declared and actual payments for each participant. For each month, individuals declare a predetermined amount which is can be considered as a projection about the future payments. In specific, we divide a participant's sum of all actual payments made to the private pension scheme to the sum of declared payments. If the ratio is equal to or greater than one than the variable takes the value of 1 and identified as the persistent payer. If the ratio is less than one than the dummy variable takes the value of zero, suggesting that the participant is not persistent. Accordingly, 2,039 participants out of 6,025 participants are persistent payers whereas the remaining 3,986 are classified as non-persistent payers.

$$\ln\left(\frac{p}{(1-p)}\right) = \beta_0 + \beta_1 X_k \tag{1}$$

Table 1. Definitions of the variables

Variable	Description
Persistency	Dependent variable (Persistent=1, Non-persistent=0)
Age	Age of the customer when he/she enters into the system
Gender	Dummy Variable (Man=1, Woman=0)
Marital Status	Dummy Variable (Married=1, Single=0)
Education	Dummy Variable (Bachelor degree or more=1, otherwise=0)
Region	Dummy Variable (If the customer lives in İstanbul=1, otherwise=0)
Risk	Average risk level of the costumers' investment choice during the research period.
Contribution	Logarithm of the contribution of the customer decided at the beginning of the contract
Period	Total number of months customer stays in the system during the observation period

Table 1 provides the definitions of dependent and independent variables used in our analysis. *Persistency* is the dependent variables which takes the value of 1 for persistent participants and 0 for non-persistent ones. *Age* identifies the exact age when the participant entered in to the private pension scheme. *Gender* is a dummy variable taking the value of 1 if the participant is man and zero otherwise. *Marital Status* is also a dummy variable taking the value of 1 if the participant is married and zero if unmarried. *Education* variable takes the value of 1 if the participant has at least a Bachelor's degree and zero if otherwise. For the *Region* variable, we differentiate the individuals as the ones living in Istanbul, which take the value of 1, and the ones who live in any other city in Turkey but Istanbul, taking the value of zero. We took Istanbul as the reference point as the GDP per person of the residents of Istanbul is remarkably the country's highest and it is the industrial and financial center of Turkey[1]. The *Risk* variable shows the average risk level of the participant's investment choice. AHE's pension scheme provides 20 investments funds and they are segregated in to three different groups; namely, high-risk funds (HR), medium-risk funds (MR) and low-risk funds (LR). Each monthly payment of the participant is directed to these fund categories. While calculating the *Risk* variable; HR, MR and LR are coded as 2, 1 and zero respectively and weighted average of the allocation is the value of the *Risk* variable. For example; a participant allocated 50% of his monthly payment to HR, and the rest of 30% and 20% to MR and LR respectively. If the *Risk* variable is for a participant is equal to 1.3, then it was calculated as; $(2 \times 50\%) + (1 \times 30\%) + (0 \times 20\%) = 1.3$. Consequently, the *Risk* variable takes a value between zero and two. The *Contribution* variable shows the monthly payment amount declared in the contact at the beginning of the private pension scheme and measured as the natural logarithm of that amount. Lastly, the *Period* variable is the total number of months that the customer stays in the private pension system. In our analysis we stipulated a customer remains minimum 12 months in the system to be included in our dataset to move on with the relatively persistent participants.

Table 2. Summary statistics of the explanatory variables

Variable (Continuous)		Non-persistent (0)	Persistent (1)	t-value
Age	Mean	34.820	36.27	-5.791***
	Std. Dev.	9.162	9.219	
	Median	33.000	35.000	
	Min.	18	18	
	Max	75	71	
Risk	Mean	0.637	0.697	-4.359***
	Std. Dev.	0.491	0.530	
	Median	0.687	0.700	
	Min.	0.000	0.000	
	Max	2.000	2.000	
Variable (Continuous)		**Non-persistent (0)**	**Persistent (1)**	**t-value**
Contribution	Mean	4.787	4.911	-8.146***
	Std. Dev.	0.518	0.630	
	Median	4.859	4.977	
	Min.	3.401	3.201	
	Max	8.006	10.820	
Period	Mean	39.740	48.540	-14.294***
	Std. Dev.	21.052	25.365	
	Median	35.000	47.000	
	Min.	12	12	
	Max	105	105	
Variable (Categorical)		**Non-persistent (0)**	**Persistent (1)**	**Chi-square value**
Gender	Mean	0.520	0.500	4.234**
	Std. Dev.	0.499	0.500	
	Median	1.000	0.000	
	Min.	0.000	0.000	
	Max	1.000	1.000	
Marital Status	Mean	0.700	0.740	12.851***
	Std. Dev.	0.458	0.436	
	Median	1.000	1.000	
	Min.	0.000	0.000	
	Max	1.000	1.000	
Education	Mean	0.400	0.570	159.906***
	Std. Dev.	0.491	0.494	
	Median	0.000	1.000	
	Min.	0.000	0.000	
	Max	1.000	1.000	
Region	Mean	0.340	0.390	13.150***
	Std. Dev.	0.474	0.487	
	Median	0.000	0.000	
	Min.	0.000	0.000	
	Max	1.000	1.000	

Note. This table demonstrates key statistics of the variables used in the estimations. The number of non-persistent and persistent participants are 3986 and 2039 respectively. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 2 shows the descriptive statistics for our sample and the differences between the mean values of all the variables are statistically significant. On average, participants are nearly 35 years of age, medium risk takers, married and not from Istanbul, which contains around 19% of the Turkey's population.

4. Results

The logistic regression results for the entire sample can be found in Table 3. First, we find that the likelihood of being a persistent payer is negatively related with being a man. Women are more meticulous in their payments to the private pension scheme because of more pessimistic outlook of the future for them and their relatively longer

standing in the defined benefit system. Being married also increases the likelihood in the persistence. Aligning with the findings of previous studies for the creditworthiness of individuals, education also increases the probability of being a persistent payer. Despite having a relatively weak statistical significance, being located in Istanbul also raises the likelihood of persistency. Participants are found likely to be more persistent as their risk tolerance surges. Lastly, as the declared amount of payment and the amount of time remained in the system increases the possibility of being a persistent payer rise as well.

The finding that being a woman increases the likelihood of being a persistent payer reinforces the need to reiterate our analyses for the investigation of the impact of demographic and socioeconomic factors on the payment persistence of private pension installments through the segregation according to genders.

Table 3. Parameter estimates of the Logit model

Parameter	Estimate	Wald Chi-Square	Significance	Exp(β)
Constant	-3.473	180.649	0.000	0.031
Contribution	0.167	10.003	0.002	1.181
Age	0.013	16.550	0.000	1.013
Gender	-0.179	9.738	0.002	0.836
Marital Status	0.223	10.923	0.001	1.250
Education	0.699	143.376	0.000	2.013
Region	0.133	5.041	0.025	1.142
Risk	0.381	42.186	0.000	1.464
Period	0.018	202.256	0.000	1.018
Goodness of fit tests	*Value*	*p-value*		
Negalkerke R Square =	0.105	n/a		
H-L Significance =	3.387	0.908		
Log Likelihood =	476.498	0.000		

Note. This table demonstrates the estimated coefficients of the variables. The last column indicates the odds ratio. Significance of the model is tested by the Hosmer-Lemeshow Chi-Square test.

Table 4 reports the results after reapplying the analyses for women only. Total number of observations is 2,144. Firstly we find a positive association between being a persistent payer and being an older, more educated, higher risk taker participant and staying in the system for a longer period. However, our results are at odds with the previous finding about being located in Istanbul given that the coefficients representing these variables are found to be statistically insignificant. Women located outside of the industrial and financial center of Turkey is not found to be more encouraged to save more for their pension to fight against relatively less available opportunities. We also find that marital status does not have any impact for women's payment persistence. This is contrary to the finding by Johanisson (2008), that married women are likely to be more persistent payers given that they do not have the financial security of having a male as a breadwinner.

Table 4. Parameter estimates of the Logit model-Women

Parameter	Estimate	Wald Chi-Square	Significance	Exp(β)
Constant	-4.033	109.735	0.000	0.018
Contribution	0.303	14.505	0.000	1.355
Age	0.013	7.687	0.006	1.013
Marital Status	0.145	2.454	0.117	1.156
Education	0.686	67.108	0.000	1.985
Region	0.073	0.759	0.384	1.075
Risk	0.425	24.214	0.000	1.530
Period	0.018	92.066	0.000	1.018
Goodness of fit tests	*Value*	*p-value*		
Negalkerke R Square =	0.103	n/a		
H-L Significance =	13.680	0.090		
Log Likelihood =	3565.938	0.000		

Note. This table demonstrates the estimated coefficients of the variables. The last column indicates the odds ratio. Significance of the model is tested by the Hosmer-Lemeshow Chi-Square test.

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Note

Note 1. See, Karan, Arslan-Ayaydin and Alatli, 2009 for further discussions.

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