Araştırma Makalesi ● Research Article

A Description of Pension Investors in Turkish Defined Contribution Pension Plans

Bireysel Emeklilik Sistemi Yatırımcı Portföylerinin İncelenmesi

Güzhan GÜLAY[a]* Korkmaz ERGUN[b] Yaşar ERSAN[c]

[a] Doktor, Borsa İstanbul A.Ş., İstanbul/TÜRKİYE
ORCID: 0000-0002-1714-185X
[b] Doktor, Borsa İstanbul A.Ş., İstanbul/TÜRKİYE
ORCID: 0000-0003-1014-6460
[c] Doktora Öğrencisi, Michigan Üniversitesi, Ekonomi Bölümü, Michigan/ABD
ORCID: 0000-0001-6468-9204

MAKALE BİLGİSİ	ÖZ
	Bu çalışmada Türkiye'deki emeklilik planı yatırımcılarının yatırım tercihleri, portföy dağılımları ve getirileri, Aralık 2019 değerlerini kapsayan detaylı idari verilerle, ampirik olarak incelenmiştir. Prim ödemeli emeklilik planı yatırımcılarının portföy tercihlerini analiz edebilmek amacıyla, portföylerdeki hisse senetleri, borçlanma araçları ve standart fonların ağırlıkları incelenmiştir. Sonuçlar, emeklilik portföylerinde hisse senetleri, borçlanma araçları ve standart fonların ağırlıklarının heterojen olduğunu göstermektedir. Ancak portföy getirileri yatırımcılar arasında çok büyük değişiklik göstermemektedir. Ayrıca, emeklilik birikimlerinin miktarlarında önemli oranda eşitsizlik gözlenmektedir. Portföyler içerisinde yer alan hisse senedi fonlarının ağırlıklarının da çok küçük olduğu tespit edilmiştir. Borçlanma araçlarının fon ağırlıkları daha yüksek olsa da, bu durum borçlanma araçları için de geçerlidir. Bu durumun aksine, portföylerde standart fonlarının portföy ağırlıklarının, hisse senedi ve sabit getirili fonlarla karşılaştırıldığı zaman çok yüksek olduğu belirlenmiştir. Bu sonuçlar, Türk emeklilik yatırımcılarının standart fonlara bağlılığının yaygın olduğunu göstermektedir.

ARTICLE INFO	ABSTRACT
	In this article we empirically study the investment behavior, portfolio distribution and returns of the pension investors in Türkiye with an extraordinarily high-quality administrative data in December 2019. To analyze the variation in investors' portfolios of defined contribution pension plans, we calculate the share of wealth invested in the equity, fixed income and default funds. Results show that there is substantial heterogeneity in the level of pension wealth invested in equity funds, fixed income securities funds and default option funds. However, portfolio returns do not significantly vary among investors. Also, the distribution of pension wealth in defined contribution pension plans are extremely unequal. The portfolio weights of equity funds are very small. Although the distribution is slightly better for fixed income funds, almost the same pattern is for these portfolios. On the contrary, the portfolio weights of default funds are very high compared to equity and fixed income funds. This shows that stickiness to the default option is widespread for Turkish pension investors.

---

* *Sorumlu yazar/Corresponding author*.
e-posta: guzhan.gulay@borsaistanbul.com

Introduction

The increase in life expectancy of individuals and decreasing number of working individuals against retired has started to jeopardize the retirement systems throughout the world. Ageing population with longer pension payments and rising health care costs is increasing pressure on the public budgets. In some studies the pension systems of some countries especially countries from Eastern Europe, are challenged by pension crisis. To overcome this pressure regulators had to think over some structural reforms to strengthen public pension systems (Ionescu, 2013). Pension funds are regarded as a crucial component of the retirement system since they provide individuals with an important pathway through which to save for retirement as well as serve to encourage and boost long-term investment. (Kayhan et al., 2021).

Private pension systems has been put into practice as an additional step to these structural changes in regulations. Consequently, the sharing of social risks by the private pension system has alleviated the financial burden of the public pension system. Participation in the private pension system, which is based on savings, is optional. The private pension system enables participants to make long-term savings and helps to increase their income during retirement. The contributions of the participants to the system are converted into investments by the pension companies, which provides national resources to the country's economy (Erol, 2019). One of the key characteristics defining the current development path of pension funds is the switch from the classic defined benefit (DB) scheme to the defined contribution scheme (DC) from the early 2000s (Thomas et al., 2014).

This article for the first in the literature examines the wealth accumulation (portfolio size), investment decisions, and performance regarding portfolio returns in Türkiye in defined contribution pension plans. To quantify those corresponding measures, we employ an unusually administrative data set covering the universe of all individual retirement accounts in Türkiye. The relevant data set has information on portfolio details, choices of funds, fund types, and also how an investor allocates her money in different set of options. Moreover, we adapt a kernel density approach to illustrate the statistical distribution of the outcomes we focus on. For a more parsimonious investigation, we divide our population into percentiles and also we calculate Gini Coefficient for each outcome we concentrate to quantify the inequality.

Results show that the wealth in defined contribution pension plans are distributed severely uneven. The bottom 25th percentile has just 216 Turkish Liras whereas the top 1 percent has 154,056 Turkish Liras. The average of portfolio size is 10,240 Turkish Liras, despite the median of the distribution of wealth in pension plans of 1,455 Turkish Liras. In line with this, the Gini Coefficient for the wealth DC pension accounts is 0.82, revealing unequally distributed wealth. Considering portfolio returns, most of the investors outperform the annual inflation rate of 14.6% in 2020. The share of wealth invested in equity funds is very small. Even in 75th percentile it is zero, showing that Turkish pension investors are not likely to prefer holding equity funds in their pension portfolios. Similar tendency also emerges in portfolio weights of fixed income securities funds. Relative to equity funds, the weights of fixed income securities funds are higher. Lastly, the default option is common among Turkish investors very similar to the pension accounts in foreign countries such as the US and Sweden as documented by Benartzi and Thaler (2007). Consequently, default effect which is the ownership of default pension fund in individual retirement accounts is common among Turkish investors in Türkiye.

This article relates to several parts of the literature. Prior research has documented that equity exposure i.e. the equity ownership is substantially low in defined contribution pension plans. Benartzi et al. (2001) report that the equity exposure is minimal among US investors and also as the number of equity funds increases together with investment in equities. Moreover, a growing body of research emphasizes the role of default effect in pension plans. A research by

Cronqvist et al. (2004) finds evidence that over 90% of Swedish pension participants choose the default pension fund. Our study is the first describing the investment decisions of Turkish pension plan participants in terms of equity exposure and stickiness to the default fund. Results show that Turkish pension investors are also similar to pension investors in either the US or Sweden.

Literature and Private Pension System in Türkiye

It was 1990s when the balance of income-expenditure in the Turkish social security system reached to critical levels and in the pension system and the asset/liability ratios reached to accepted critical levels for the system (Yaşarlar, 2016). Together with this critical financials the changing demographics with increasing life expectancy and falling birth rates, advances in medicine, the desire for a better quality of life in retirement, and the social security system all contributed to the development of a new pension system that aims to meet both social and economic hopes in Türkiye. People who had the pension systems targeted to retain better life qualities at the end of the working period by saving throughout time (Özaydın, 2019).

Capacity of the retirement savings plans to supplement and suffice as retirement income depends greatly on their long-term viability and durability. A clear framework that would benefit from an open and transparent discussion on the role of governments, policy makers, and regulators in determining the aims of these arrangements is needed in order to evaluate the complementary roles for adequacy. It will also be required to regularly evaluate the effects of various policies on the adequacy of retirement income, using the proper indicators and objectives, and to carefully examine any deficiencies. (OECD, 2020)

In 2005 the World Bank recommended five pillar pension models concept and since than many of the Central and Eastern European nations have embraced the five pillar idea while restructuring their economies (Kagan, 2021). Taking into consideration of their method of funding, the five pillars can be divided into two groups. The first group is defined as 'pay-as-you go' or PAYGO and the other group of pillars is classified as asset-based. The PAYGO is accepted as unfunded however asset-based class is funded (Sinha, 2018).

Table 1. The Five Pillars of Modern Retirement Systems

Pillar	Essential Characteristics
Pillar 0	"Non-contributory minimal assistance to the poor, typically means-tested"
Pillar 1	"Public (government) pension (social security) schemes to provide for basic needs; contributory, redistributive, and typically financed on a pay-as-you-go basis"
Pillar 2	"Private occupational pension schemes (sponsored by employers) to supplement Pillar 1; can be voluntary or mandatory (i.e., required by the state); and can comprise defined benefit (DB) or defined contribution (DC) plans"
Pillar 3	"Individual savings to provide for future withdrawals and/or annuities in various forms; can be voluntary, but often enforced by the state
Pillar 4	A set of labor market policies to extend work life and enable more part-time work for the formally retired; informal family support as additional dimension"

Source: Table is retrieved by authors from the study of World Economic Forum (2013)

Generally it is common that dividing the pension systems into three different pillars is binding. These are public, occupational and personal pensions. According to definitions of Willmore (2001) we have summarized the general basics of the three pillars from different perspectives given below in Table 2.

Table 2. Pension Systems – Three Pillars

Tier	Pillar	Contribution	Savings	General
1	Public	Non-contributory	Basic Pension	"Anti-poverty. Guarantee a minimum income in the old age. Publicly managed and tax-financed."
2	Occupational	Contributory	Mandatory Savings	"Protects from relative poverty. Benefits for contributor. Provide as much as contribution. Privately managed and fully funded."
3	Personal Pensions	Contributory	Voluntary Savings	"Protects from relative poverty. Voluntary savings. Privately managed and fully funded. Supplement for the previous two."

Source: Table is retrieved by authors from the study of Willmore (2001, 1-6)

In Türkiye Private Pension Savings and Investment System Law was designed after an intensive work of the related ministries and counterparties and issued as a part of the social security reform in which the opinions and evaluations of all parties took part. The law was adopted by the Turkish Grand National Assembly on March 28, 2001 and enacted after being published in the Official Gazette dated April 7, 2001 and numbered 24366. The law entered into force on October 7, 2001, 6 months after its publication. With the legislative work, the necessary administrative and legal framework to ensure the effective implementation of the system was drawn, and with the initiation of the private pension system on October 27, 2003, pension companies became operational (Genç et al. 2015). The Private Pension System was established on a voluntary basis with the Private Pension Savings and Investment System Law No. 4632. The main motivation was to invest the savings of individuals for the retirement period and create additional income as a complement to the social security system. This would increase their welfare level as an additional income during the retirement period. It also would increase employment and contribute to economic development as the retired people will not need to work for extra income (Gülay et al. 2017).

After implementation of the private pension system as the required interest did not arise there has been some changes in the regulations. The primary change was the state contribution of 25% of the contribution amount to the participants since 2013. The state contribution aim was to motivate the participants to save. However, this was not as encouraging as expected and a kind of obligation was imposed on the system based on volunteerism. In order to further increase the size of pension fund assets and participation in the system, the automatic enrollment system (AES), which is mandatory for employees affiliated with an employer to be included in the Private Pension System by the employer, started to be implemented as of 2017 (Eryılmaz, 2021). The savings of the employees are invested in an "interest-bearing" or "interest-free" default fund, depending on preference. The savings of the employees, who have completed the withdrawal period and do not choose any funds, continue to be evaluated in the default fund for the following 10 months (a total of 1 year with the withdrawal period). The savings of employees who have completed 1 year and have not chosen any funds are initially invested in the standard fund according to their "interest-bearing" or "interest-free" fund preferences. Employees can make fund distribution changes 12 times a year (TSB, 2022).

One of the attractive part of the pension system was the state contributions to the pension plans. The details of the plan contained;

a. State contribution of 25% of the total contribution before 22 January 2022 and 30% after this date
b. The right for the investor to exit from the system within 2 months but if she chooses to stay state would add an additional 1000 TL as contribution
c. If the employee chooses to retire with an annuity contract for at least ten years to withdraw his savings from his private pension account, state would make a contribution of 5% over total savings.
d. The state contribution amounts will be entitled in accordance with the Regulation on the State Contribution in the Private Pension System (BES, 2022).

The pension fund investors should have paid premiums to the system for ten years after their first enrollment in order to retire, and they must also be at least 56 years old. The member may withdraw their funds and exit the system concurrently within the length of the pension contract. However, if he leaves the system before the retirement age cutoff, he will lose 15% of his funds if he does so during the first ten years and 10% if he does so after. He can begin receiving his income or collecting his savings by paying 3.75% tax on the savings of the participants who are eligible to retire (Can, 2010).

In Türkiye the private pension system is considered as the third pillar system. Considering the remaining two systems, we see that the first pillar is designed and ruled by the State and social security institutions. Considering the second pillar which is the occupational pensions is established by some financial institutions like banks and insurance companies for the personnel of their own under the transitional article of the State's social security regulations (Yamak, 2001).

There is limited literature about the pension investor investment behavior analysis in Turkey as finding a comprehensive data set to quantify the variation in pension investors' portfolios. Nonetheless, there is a small but growing literature showing pension funds' investment strategies. Correspondingly, Ilhan (2016) reports that the share of the total amount invested in government bonds and bills by funds is about 85% of the total investment in research period. A one more recent study of Ilhan (2021) reveals that the equity funds with potential high volatility in the short run have performed highest in the long run. A recent study about the relationship between individual investment contribution amount and state contribution (tax deduction) amount in Turkey finds evidence that contribution amount and total investment is positively related in the long run. However, after the start of the state contribution in 2013, a negative relationship between the individual investment contribution amount and state contribution amount in the long run is evident (Özel et al., 2019). Another study by Gülay et al. (2017) reveals that the monthly income and gender do have significant association with the likelihood of leaving the system.

Data

We use a novel and extraordinarily detailed administrative data set covering the universe of all defined contribution individual pension accounts with the number of observations around 10.3 million (10,258,176). The concerning administrative data set is provided by Takasbank A.Ş. a member of Borsa Istanbul Group. The corresponding data set has information on account balances, portfolio details with fund types, pension funds and their numbers, the composition of each pension funds by financial asset classes, the rate of return of each fund over time and trades in the month-end snapshot of December 2019. As the dataset covers the universe of all pension investors with defined contribution pension plans, it is not prone to any misreporting or mismeasurement. Thus, the selection bias is not an issue in our setting. The sample we are examining contains investors born between 1930 and 2001 including both years.

The first variable we are interested in is the logarithm of total accumulated pension wealth in individual retirement accounts since the accumulated wealth in levels is highly skewed and censored at zero. Consequently, we transformed the total accumulated pension wealth in Turkish Liras by taking the natural logarithm of the sizes. Moreover, this provides us an opportunity to illustrate the distribution of pension account size graphically. Secondly, we look for choices of funds in pension portfolios, to achieve this we focus on the portfolio weights of three different types of pension funds. These are equity, fixed income securities funds and default funds. For each outcome of interest, using the fund details in the corresponding administrative data set we calculate individual portfolio weights computing the share of wealth invested in a specific fund type in percentage terms in each portfolio.

Equity funds consist of at least 80% company shares either local which are traded in the equity market of Borsa Istanbul or foreign shares which are traded in the organized markets abroad. On the other hand fixed income securities funds contains at least 80% of domestic or foreign government or private sector bond and bills, and treasury notes. Finally default funds must consist of at least 50% bonds and bills, revenue sharing certificates, and rent certificates which are likely to be less risky. We categorize a pension fund as default funds if it is a starting fund or standard fund for those participating through automatic enrollment.

Methodology and Results

We examine the behavior of pension investors by dividing the population into percentiles. To do this, for each outcome of interest we are interested in 25th, 50th, 75th, 95th, and 99th percentiles. Furthermore, we report the mean and Gini coefficient and the underlying reason of reporting the Gini coefficient for each outcome of interest lies in the purpose of showing how unequal the related outcome is distributed. Thus, we are able to document for the first time in the literature the level of inequality in portfolio size, portfolio returns and heterogeneity of fund choices in defined contribution pension plans in Türkiye.

Last but not least, we estimate the kernel density of each variable we are involved in, which allows us to illustrate the distribution of corresponding variables that explain the variation in investor's portfolios.

We begin our analysis by providing the distributional characteristics of portfolio size. We note that we take the logarithm of each portfolio size and then we estimate the kernel density. Figure 1 implies that the portfolio size is both left and right skewed. The left skewed feature of the kernel density of portfolio sizes show that there are participants who own tiny amount of investment in the retirement accounts. Indeed around 100 thousand investors have less than 1 Turkish Lira in their pension accounts. Overall, graphical evidence indicates unevenly distributed portfolio size.
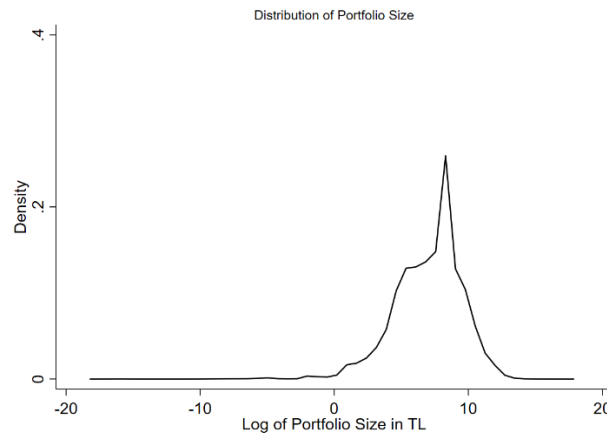
Figure 1: Distribution of Portfolio Size (in logs)
Source: It is calculated by the authors from the data obtained from Takasbank (Borsa Istanbul Group)

To examine the performance of pension investors, we calculate the counterfactual portfolio returns by fixing the end of December 2019 portfolios and calculating annual return of corresponding portfolios after one year. Then we estimate the kernel distribution of the portfolio returns and the graphical evidence in Figure 2 suggests that the returns are mainly left skewed and also all of the investors earn positive returns. Nonetheless, the official inflation rate was 14.6%, implying that substantial amount of investors earned negative real returns. We interpret that the concerning investors underperformed relative to inflation rate. Considering the median investor, it is possible to argue that she earned around 6-7 % real return. All in all, median pension investor is good enough to outperform the inflation.
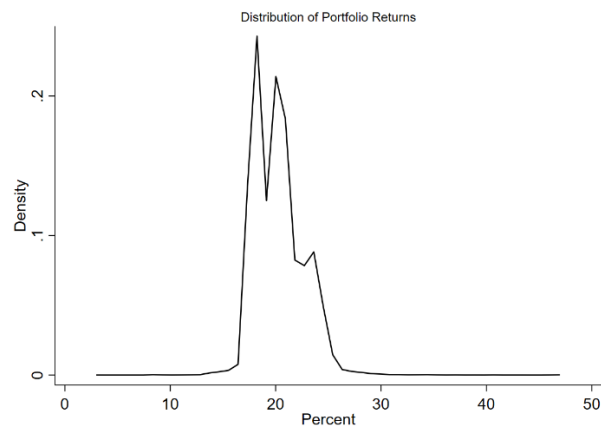

Figure 2: Distribution of Portfolio Returns (%)
Source: It is calculated by the authors from the data obtained from Takasbank (Borsa Istanbul Group)

We also investigate how the variation in terms of some fundamental fund types commonly observed in pension portfolios. We begin our analysis in this part by focusing on the portfolio weights of equity funds which are an indicator of how investors take risk. Figure 3 reveals clearly that the investors holding equity fund in their pension portfolios are quite low. This is in line with the numbers of investors holding directly stocks in Türkiye.[1] We argue that Turkish pension investors put less weight on equity funds, perhaps indicating that Turkish

---

[1] www.mkk.com.tr

pension investors have conservative investment strategies. Such strategies are possibly the ones with low risk. Altogether, Turkish pension investors do not seem to be risk lover.
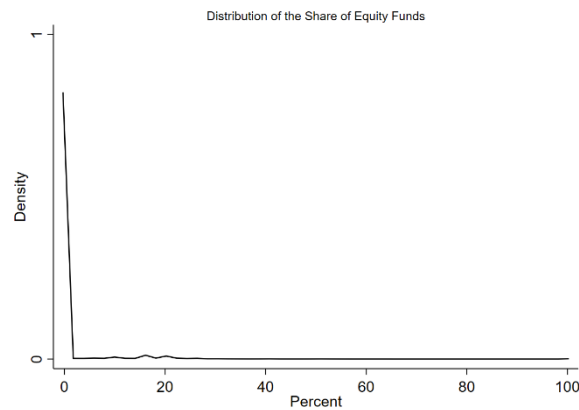

Figure 3: Distribution of Share of Equity Funds (%)
Source: It is calculated by the authors from the data obtained from Takasbank (Borsa Istanbul Group)

Figure 4 plots the kernel density estimates of the portfolio weights of Fixed Income Securities Funds. Strikingly the portfolio weights are bimodal. To clarify, investors either hold 100% fixed income securities fund or none. Combining graphical evidences in Figure 3 and 4 induces that there is room for the study of default funds. Indeed, Figure 5 reveals that part of the investors completely hold only default fund in their portfolio and the remaining half holds 0% of default fund in their pension portfolios. We interpret that half of the investors are sticky to default option, which leads to inertia.
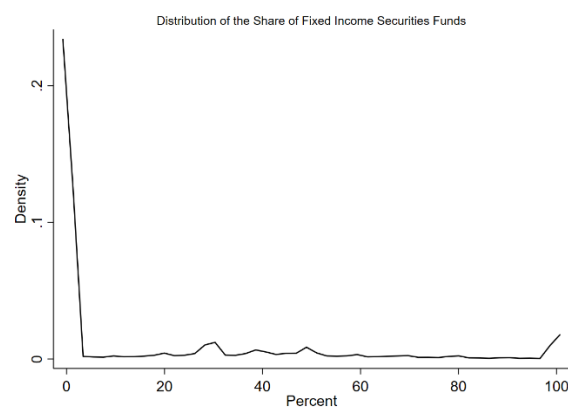

Figure 4: Distribution of Share of Fixed Income Securities Funds (%)
Source: It is calculated by the authors from the data obtained from Takasbank (Borsa Istanbul Group)
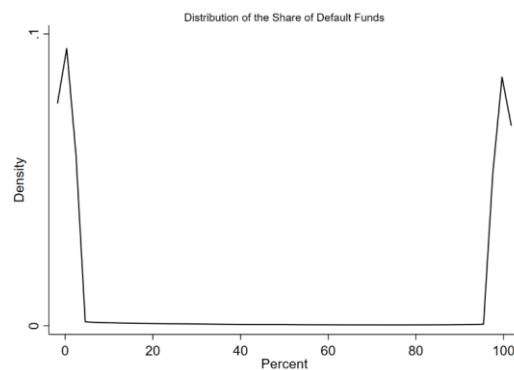

Figure 5: Distribution of Share of Default Funds (%)

Despite the graphical evidence we provide, there is room for rigorous analysis. To do this we calculate the values of each outcome of interest at percentiles. Table 1 reports our calculations covering mean, 25th, 50th, 75th, 90th, 95th and 99th percentiles, and the Gini Coefficient which allows us to measure the inequality in each outcome. In Row 1, we report the statistics for Accumulated Pension Wealth in Turkish Liras. Accordingly, the average pension wealth in defined contribution pension plans in Türkiye, in December 2019 was 10,240.1 Turkish Liras. However the related pension wealth was unevenly distributed. For instance, bottom 25th percentile has only 216.5 Turkish Lira whereas the top 99th percentile has 154,056.7 Turkish Liras. Moreover the last column of Table 1 shows that Gini Coefficient that is the measure of the inequality is more than 0.829, which suggest extreme inequality. Comparing the Gini Coefficient of the wealth in pension plans with the Gini Coefficient of 0.395 in household income in Türkiye as reported by TÜİK (2022) unfolds that pension investors experience much more inequality.

The portfolio returns are evenly distributed as the Gini Coefficient is around 0.06. Moreover, the mean portfolio return is 20.32% which is above the annual inflation rate. The difference between the bottom 25th percentile and 99th percentile is just 8%.

Table 3: Cross-Sectional Distribution

Variable	Mean	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile	99th Percentile	Gini Coefficient
	-1	-2	-3	-4	-5	-6	-7	-8
Accumulated Pension Wealth (TL)	10,240.10	216.6	1,455.98	5,868.34	21,324.21	42,219.78	154,056.70	0.83
Portfolio Return (%)	20.33	18.59	20.15	21.62	23.66	24.43	26.99	0.06
Equity Funds Portfolio Share (%)	2.2	0	0	0	5.58	18.52	36.46	0.38
Fixed Income Securities Funds Portfolio Share (%)	16.57	0	0	28.97	60.92	100	100	0.33
Default Funds Portfolio Share (%)	46.87	0	2.45	100	100	100	100	0.07

We continue studying the portfolio weights of various fund types. In Row 3 we present the portfolio weights of Equity Funds and the average Equity Fund Share is just 2.2%. The median investor do not have any equity fund in her portfolio. Even 75th percentile holds no

equity fund at all. The 99th percentile investor puts 36 Turkish Liras out of each 100 Turkish Liras. And the Gini Coefficient demonstrates moderate inequality in the share of equity funds. On the other hand, the mean portfolio weight of Fixed Income Securities Funds is 16.5%, while the median investor holds no Fixed Income Securities Funds. Besides top 99th percentile invests almost 100% of her investment into Fixed Income Securities Funds. And similarly Gini Coefficient in the corresponding variable displays moderate inequality. OECD (2021) tries to explain the high proportion of investment in bonds compared with equities with some reasons. Some of them do not apply to Türkiye. These are lack of investment alternatives, new exchange, and legal obligations. The most relevant reason is the need for a stable and secure revenue source of the pension investors.

Turkish pension investors are extremely sticky to default option as the mean portfolio weight of default funds is around 47%. It means that for each 100 Turkish Lira of investment around 47 Turkish Lira goes to the default funds. Nevertheless, the median investor invests 2.4 Turkish Lira out of 100 Turkish Lira. Conversely, from 75th percentile to top 99th percentile investors prefer investing their entire investment increasingly in default funds, which is the most prevalent behavioral bias in retirement plans (Benartzi and Thaler, 2007). The underlying reasons of this behavior might be the cognitive costs of evaluating alternative saving options and limited computational capacity as suggested by Blumenstock et al. (2018). Consequently, we focus on behavior problems as suggested by the prior literature (Madrian and Shea (2001), Benartzi and Thaler (2007), Beshears et al. (2009), Beshears and Choi (2012), Madrian (2014)). Overall, the pension investors in Türkiye are not free from behavioral biases as the pension investors in developed countries such as the US and Sweden.

Conclusion

This article is an empirical investigation of pension investors and the way how they accumulate wealth in DC pension plans, how their portfolios perform in terms of rate of return, and how they choose the funds they invest in. To do this, we exploit an extraordinarily high quality administrative data set spanning the entire universe of all individual retirement accounts. The corresponding data set allows us to investigate deeply the affairs of Turkish pension investors in December 2019. Results unfold substantial heterogeneity in the level of pension wealth, portfolio returns, the weight of equity and fixed income securities funds, and also the role of default option.

Our results first imply that the wealth in DC pension plans are extremely unequal. While the bottom 25th percentile has only 216 Turkish Liras the top 1 percent has 154,056 Turkish Liras. The mean investor has 10,240 Turkish Liras however the median investor has 1,455 Turkish Liras. Besides, the Gini Coefficient for the wealth DC pension accounts is 0.82, implying substantial unevenly distributed wealth. In addition, portfolio returns mostly are above the annual inflation rate of 14.6% in 2020. The portfolio weights of equity funds are far from being considerable particularly very small values. Even in 75th percentile it is zero, showing that Turkish pension investors primarily do not prefer holding equity funds in their pension portfolios. Similar patterns also arise in portfolio weights of fixed income securities funds. Relative to the case of equity funds, the weights of fixed income securities funds are more promising. Finally the default option is common among Turkish investors, which is very similar to the pension accounts in foreign countries such as the US and Sweden. Overall, stickiness to default is prevalent in Türkiye.

For the future studies, analysis of the risk taking behavior of pension investors in Türkiye might allow us to have better understanding of how successful Turkish pension investors are while bearing potential investment risks in pensions. Also the policy makers should pay attention to the design of the default funds, if necessary, revise or redesign it as our

results indicate that stickiness to default and inertia which are the commonly observed behavioral biases is widespread.

References

Beshears, J. and Choi, J. J. (2012). Default stickiness among low-income individuals. Working Paper.

Beshears, J, Laibson, D. and Madrian, B. C. (2009). The importance of default options for retirement saving outcomes: Evidence from the United States. In Social security policy in a changing environment, University of Chicago Press, pp. 167-195

Benartzi, S. & Thaler, R. H. (2001). Naive Diversification Strategies in Defined Contribution Saving Plans, The American Economic Review, American Economic Association, 91(1), 79-98, https://www.jstor.org/stable/2677899

Benartzi, S. & Thaler, R. H. (2007). Heuristics and biases in retirement savings behavior. Journal of Economic Perspectives, 21 (3), 81-104.

BES, (2022). Devlet Teşvikleri, Devlet Katkısı, BES Türkiye Sigortalar Birliği, https://www.otomatikbes.info/devlet-tesvikleri

Blumenstock, J., Callen, M., & Ghani, T. (2018). Why do defaults affect behavior? Experimental evidence from Afghanistan. American Economic Review, 108(10), 2868-2901.

Can, Y. (2010). Bireysel Emekliliğin Türkiye'deki Durumu ve Gelişimi. Ekonomi Bilimleri Dergisi, 2 (2), 139-146. https://dergipark.org.tr/tr/pub/ebd/issue/4856/66804

Cronqvist, H., & Thaler, R. H. (2004). Design choices in privatized social-security systems: Learning from the Swedish experience. American Economic Review, 94(2), 424-428, https://www.jstor.org/stable/3592922

Erol, I. S. (2019). Sosyal Güvenlik Açısından Bireysel Emeklilik Sisteminin Önemi. İktisadi Yenilik Dergisi, 6 (2) , 10-29. https://dergipark.org.tr/tr/pub/iy/issue/46636/530137

Eryılmaz, Y. (2021). Otomatik Katılım Sistemi Sonrası Bireysel Emeklilik Şirketlerinin Performanslarının Ölçümü: Türkiye Örneği, Institution of Economic Development and Social Researches Publications, Iksad Publications – 2021.

Genç, T., Kabak, M., Köse E. & Yılmaz, Z. (2015). Bireysel Emeklilik Sistemi Seçimi Problemine İlişkin Macbeth Yaklaşımı, Ekonometri ve İstatistik, 2015(22), 47-65.

Gülay, T. Işık, M. & Öztürk, M. (2017). Türkiye'de Bireysel Emeklilik Sistemi Ve Akademisyenlerin Otomatik Katılıma Bakış Açılarına İlişkin Bir Analiz: Süleyman Demirel Üniversitesi Örneği. İş ve Hayat, 3 (6), 179-205. https://dergipark.org.tr/tr/pub/isvehayat/issue/34275/378862

İlhan, B. (2016), OECD Ülkeleriyle Karşılaştırmalı Olarak Türkiye'de Bireysel Emeklilik Sistemindeki Gelişmeler Üzerine Eleştirel Bir Yaklaşım, Üçüncü Sektör Sosyal Ekonomi, 51 (2), 157-185. https://www.acarindex.com/pdfs/366841

İlhan, B. (2021). Türkiye'de Gönüllü Katılım Esaslı Emeklilik Yatırım Fonlarının Performans Ölçümü: Emeklilik Şirketi Özelinde Vaka Analizi. 8 (17), 343-367

Ionescu O.I. & Elisabeta J. (2013). The Evolution and Sustainability of Pension Systems the Role of the Private Pensions in Regard to Adequate and Sustainable Pensions, Journal of Knowledge Management, Economics and Information Technology, ScientificPapers.org, 3(6), 1-13.

Kagan, J. (2021). Investopedia, Retirement Planning, Pensions, Pension Pillar, Reviewed by Pamela Rodriguez, 15 November 2021.

Kayhan. F & Egrican, A.T. (2021). An Overview Of Voluntary Private Pension Funds in Turkey, Finansal Araştırmalar ve Çalışmalar Dergisi 13(25), Temmuz 2021, ISSN: 2529-0029, 586-607 DOI: 10.14784/marufacd.976622

Madrian, B. C. (2014). Applying insights from behavioral economics to policy design. Annual Review of Economics, 6 (1), 663-688.

Madrian, B. C., & Shea, D. F. (2001). The power of suggestion: Inertia in 401 (k) participation and savings behavior. The Quarterly journal of economics, 116(4), 1149-1187.

OECD (2020). OECD Pensions Outlook 2020 – Highlights, 3, OECD Publishing, Paris. https://www.oecd.org/daf/fin/private-pensions/Pensions-Outlook-2020-highlights.pdf

OECD (2021), Pension Markets in Focus 2021, www.oecd.org/finance/pensionmarketsinfocus.htm

Özaydın, A. & Sekman M. (2019). Türkiye'de Tasarruf Açığının Karşılanmasında Bireysel Emeklilik Sistemi. Vergi Raporu, 0(243), 111 - 131.

Özel, H. A. & Pınar Çengelcik, Ç. (2019). Türkiye'de Bireysel Emeklilik Sistemi Katılımcılarının Fon Tutarını Belirlemeye Yönelik Bir Analiz. Girişimcilik ve Kalkınma Dergisi, 14 (1), 19-29. https://dergipark.org.tr/tr/pub/girkal/issue/46790/567779

Sinha, R. (2018). Pension Finance and Management, Module 1 Design, Topic 1: The World Bank's Five Pillar Framework, Toronto, ON: eCampusOntario. https://ecampusontario.pressbooks.pub/pensionfinance/

Thomas, A. Spataro L & Mathew, M. (2014). Pension funds and stock market volatility: An empirical analysis of OECD countries, Journal of Financial Stability, Volume 11, 2014, 92-103, ISSN 1572-3089. https://doi.org/10.1016/j.jfs.2014.01.001

TSB (2022). Türkiye Sigorta Birliği (TSB) Bireysel Emeklilik Sistemi & Otomatik Katılım Sistemi Sıkça Sorulan Sorular. https://tsb.org.tr/media/ckeditor_uploads/2022/03/14/bes-sss.pdf

TÜİK (2022). Türkiye İstatistik Kurumu, Haber Bülteni, Gelir ve Yaşam Koşulları Araştırması, 2021, 06 Mayıs 2022, Sayı: 45581. https://data.tuik.gov.tr/Bulten/Index?p=Gelir-ve-Yasam-Kosullari-Arastirmasi-2021-45581#:~:text=Gini%20katsay%C4%B1s%C4%B1%200%2C401%20olarak%20tahmin%20edildi&text=En%20son%20yap%C4%B1lan%20ara%C5%9Ft%C4%B1rma%20sonu%C3%A7lar%C4%B1na,ile%200%2C401%20olarak%20tahmin%20edildi.

Willmore, L. (2001). Three Pillars of Pensions: Is there a Need for Mandatory Contributions? In OECD (Eds.), Private Pensions Series, OECD 2000 Private Pensions Conference, No: 3. (pp. 385-397), OECD Publishing, Paris, France. 2001.

World Economic Forum (2013). Developing Future Social Protection Systems, Retirement Income, Sustainability, Risks and Challenges of Current Retirement Income Schemes. https://www3.weforum.org/docs/WEF_FS_RetirementIncome_Report_2013.pdf

Yamak, S. (2001). Draft Law for Individual Pension System. In OECD (Eds.), Private Pensions Series, OECD 2000 Private Pensions Conference, No: 3. (pp. 43-64), OECD Publishing, Paris, France. 2001.

Yaşarlar, Y. (2016). Aktüeryal Dengenin Sürdürülebilirliği: Türkiye Deneyimi, (Unpublished PhD Thesis). T.C. İstanbul Üniversitesi/Sosyal Bilimler Enstitüsü, İstanbul. http://nek.istanbul.edu.tr:4444/ekos/TEZ/54721.pdf