



DETERMINANTS OF FINANCIAL SUSTAINABILITY AND GROWTH: AN ANALYSIS OF TURKISH PENSION FUNDS

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ABSTRACT

The purpose of the study is to investigate the relationship between pension funds' sustainability and firm-level factors (Size, Age, Contribution level, EBIT, Board Competency, Board Size, Operational Risk, Admin Expenses, and Effective Tax Rates). The study helps to know the factors to support the enormous asset holding the financial sector of Turkey. The dynamic panel data model technique was used to determine the core micro factors determining pension funds' sustenance. Panel data of fifteen pension companies from 2005-2017 was used for Analysis. The data analysis suggests that financial sustainability, size and age of the firm, contributions, income, and board competency have a significant and positive effect on financial sustainability. In contrast, the board size, operational risk, operating and administrative expense, effective tax rate, and financial crisis of 2008 negatively affect the pension fund company's financial sustainability. The approach used in the paper could be of practical benefit to the Capital Market Board and Finance Ministry of Turkey in their decision making regarding pension fund management and core determinants behind it.

Keywords: Financial Sustainability, Contribution level, EBIT, Board Competency, Board Size, Operational Risk.

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1. INTRODUCTION

A middle-income country that started its journey in 1923 has faced great economic, political shocks. In passing its ninety-five years, the economy is now an upper-middle-income country. The economy has interesting phases of development. Turkey's pension system is supervised and regulated by the Capital Market Board (CMB) responsible for managing the institutional and individual funds. The board has a legal contract with the pension companies. The board takes responsibility for the active management of the pension mutual funds in accordance with the fund management policies of Pension Company. The Pension companies may also contract with various portfolio management companies to manage multiple funds that provide competitive and dynamic markets. Pension funds evolution in Turkey has a history of about two decades. In March 2000, the law was submitted to parliament, which took almost two and a half years to reach the enforcement phase; the first pension contract was signed in October 2003.

A defined contribution plan works in the country with strong regulations to safeguard the citizens of the state. The companies need a start-up of \$~7-mio, and the same amount is to be paid within three years as well; these companies are licensed under the secretariat of Treasury. The companies are supposed to have robust IT and financial infrastructure, i.e., recovering initial capital strain. Usually, 51% of the companies' shares belong to financial institutions. Portfolio management companies manage the assets of such pension companies. Before 2006, the social security system of Turkish was made up of three separate social security institutions:

- a. SSK, for private and public sector workers
- b. ES (Emekli Sandığı), for civil servants; and
- c. Bağ-Kur, for self-employed workers and farmers

These systems failed due to the heavy deficit burden upon them in the decade of 1994-2004 of around 475 billion YTL in 2004 accounting prices for 110% of Turkish GDP. In 2006 a reform was introduced to cover up these deficits and reach a certain level in four decades, i.e., 2045, by unifying these three systems to a single security system that is healthier than before. However, like all other economies, the financial crises of 2008 hit the Turkish economic system.

To preserve the state's economic welfare, the Turkish government has passed new legislation that applies the rule of automatic participation of the employees in the pension system. The law enforces from the beginning of 2017, having a core motive of raising the national saving rate (Global Mobility, 2016). The study aims to analyze the critical determinants of pension funds' growth and their sustainability at the micro level for several reasons, some of which are described below.

- As compared to other OECD countries, the rate of social security compliance is meager, the pure scale of the informal sector, and squat levels of productivity and human capital propose that the contribution rates are high, which is more harmful in Turkey as compared to other wealthier nations' higher tax wedges (Gönenç, 2006).
- Turkey, out of all OECD nations, is the length of pension age enjoyed by Turkish citizens. At present, women have the pension eligibility age of 44, and a life expectancy of 76 years, she enjoys retirement period of 32 years on average. In contrast, men, having pension eligibility age of 47, want a retirement period of 28 years on average

(life expectancy of 75 years). Such a long pension period motivates studying the pension system in the selected country intensely (Brook and Whitehouse, 2006).

- According to World Bulletin (2016), Turkey is performing best among all OECD economies. It has grown at a rate of 5.2%, which is the second highest in Europe. It is considered significant to analyze the pension fund growth factors of such an emerging economy.
- The financial crises of 2008 hit almost every economy of the world, i.e., huge or small. From the perspective of pension funds, the past studies did not include the financial crises of 2008 in their studies (Ersin et al., 2015). However, the current research depicts the impact of the world financial crises in Turkish pension funds' growth with a larger sample than before.
- Along with Denmark, Turkey is the country that responded to global responses by overcoming them with 11.6%, which is the highest of all OECD countries (Ersin et al., 2015).

The up-coming sections cover the hypotheses development, theoretical framework, methodology, results analysis, and interpretation of the firm-level micro-economic factors such as size, age, profitability, contributions received, board size and competency, operational risk, operating expenses, and taxes responsible and their impact on pension funds growth in Turkey.

1.1. Literature Background and Hypotheses Development

After an intense review of past studies, the current study was designed. Table-1 in the Appendix section supports the study by depicting some of them briefly. Based on the literature following hypotheses were formulated for analyzing micro factors' role behind the financial sustainability of pension funds in Turkey.

Hypothesis Development

1.2. Size and Financial Sustainability

One of the core factors that impact financial stability is the size of the pension company, i.e., asset holding (Lafourcade, 2005). In the view of Haunerl et al. (2007), the higher the asset holding of a company, the faster it moves on the growth path, and the higher is the growth rate of a pension firm, more are the chances of its sustenance. The study further explains a huge pension funds administrator's ability that they are more likely to gain stability. Woller (2002) found that high-profit motives attract the pension firms to grow, and the idea was termed as scaling up. And to do so, the firms start serving more retirees Mersland and Storm (2009). Several studies used the number of retired registered to financial stability and found a positive relationship between them. In light of the above literature, the study uses the following hypothesis for Analysis:

H1: The size of the pension firm has a positive impact on its financial sustainability

1.3. Age of Pension Firm and Financial Sustainability

Time teaches everything; the proverb is applied in pension firms to find out whether it works or not. Several studies have proved that as the age of a firm grows, its efficiency inclines, and so it moves to the pace of financial stability (Christen, 2000: Christen, et al., 2007; and Woller, 2000). Shankar (2007) suggests that interest income is one of the primary revenue sources for the pension fund, which rises with time. According to Knell (2005), pension firms improve their administrating efficiency to achieve financial sustainability. In light of the past literature, the following hypothesis is postulated in the current study to analyze its applicability in OECD countries:

H2: The age of a pension funds management company is positively associated with financial sustainability.

1.4. Contribution and Financial Sustainability

The more sugar you add, the sweeter is the output. The amount of contribution made by both employer and employee contributes towards the firm's profits. However, according to Bodie et al. (1988), it is not the contribution alone. Still, it is the firm administrators' efficiency who mobilizes the stakeholders' contributions efficiently. According to G20 (2010), the contribution leads to a rise in revenue. Regarding the studies in the past, the current study hypothesizes the following relationship for Analysis:

H3: There is a strong association between a pension firm's contribution level and its financial sustainability.

1.5. Net Income of Firm and its Financial Sustainability

The bigger the firm's income level, the higher the chances of it being financially sustainable. Shreiner (2002) reports that the firm's profit levels are the best predictors of its financial sustenance. Gonzalez-Paramo (2005) adds to the literature that profits are raised not by efficient revenue strategies alone but by minimizing operation costs. A firm that makes most of its available resources becomes efficient and yields stability in every aspect, along with finance (Christen, 2000). Studies like Knell (2005) and Hauner et al. (2007) find the firm's income level and financial stability moving in the same direction, i.e., an expertise pension fund would operate at least expenses and higher income levels to stay stable. In light of the past literature, the study bases the following hypothesis for Analysis:

H4: There is a strong association between a pension fund's net income and its financial sustainability.

1.6. Board-Competency and Financial Sustainability

How efficient is the board of the pension company formed? It is essential for a PF to focus upon its' board members' skills (Yermack, 1996). Another study by Penalva (2005) reports that a firm with competent board members will not lead to instability. According to Chtourou et al. (2001), competent board members perform their best to keep the firm on the path of sustainability. They are eligible enough to stop their deviation from there. This is just consistent with the view of (Park & Shin, 2004), who adds board members' experience in their expertise. However, competent members require a luxury package from the companies, and if they work smartly for their interests, this competency can be harmful to the growth of pension funds (Park & Shin, 2004). In view of the studies observed, the study formulates the following hypothesis to analyze the situation of OECD countries:

H5: Board competency of the pension firm is associated with its financial sustainability

1.7. Board-Size and Financial Sustainability

What is the best size of the board of a pension firm that could put the company to excel on the path of financial sustainability? Has always been a topic of attraction for the researchers. Heeder (2010). a report in their study that no one size is suitable for all sorts of the firm. However, a set of ten board members was considered a good one (Jensen, 1993); the better is the coordination between the board members, the higher chances of it to grab sustainability in financial and other matters. Xie et al. (2003) report that larger boards have more efficiency in handling the firm's stability. On the other hand, (Yao et al., 2013) found a negative relation between board size and financial stability. Keeping these controversial results observed in

different countries, the current study aims to find out the scenario in OECD countries by analyzing the following hypothesis:

H6: Board size of a pension firm is associated with its financial stability.

1.8. Risk and Financial Sustainability

A firm may be facing different types of risks, such as business risk, market risk, credit risk, and many more. This study considers the business risk for Analysis and its impact while taking financing decisions by the firm. The firm's financial sustainability may be influenced by the amount of risk a firm undertakes for a project. There are chances of bankruptcy or financial distress if not paying the debts or pension funds benefits to policyholders in time. Therefore, different risks are always inherent while designing a pension scheme and making their financial decisions, such as the mixture of different pension investment strategies in different categories. Some researchers have found a negative relationship between financial sustainability and risk (Baranoff et al., 2007; Titman & Wessels, 1988). Many studies have shown a negative relationship between financial structure and business risk, noting that assets' value decreases with an increase in business risk. There may be a reason that the firms try to rely more on internal financing and less on external financing when they face any type of business risk (Eldomiaty, 2007; Ahmed Sheikh & Wang, 2011; Abor & Biekpe, 2009; Al-Najjar & Taylor, 2008, Heshmati, 2001). This study will contribute to the literature because if the firms are facing some operational deficiency or a crucial situation, what would be the importance of business risk in determining the firm's financial sustainability of that firm. This study is taking operational risk into account for Analysis, and this is calculated as the ratio of the percentage change in income to percentage change in revenues. (Al-Ajar & Taylor, 2008). In view of the above literature current study focuses upon the following hypothesis;

H7: Risk has a negative association with the financial sustainability of pension firms

1.9. Administrative Expenses and Financial Sustainability

Expenses have a direct impact on a firm's profitability, and a reduction in profits yield to a decline in the stability of the pension firm. As discussed in the second chapter of the study, the expenses impact the firm efficiency, (Woller 2000) suggested that the pension firms ought to achieve efficiency in their management system to sustain. Several studies have been observed in the past which target expenses directly and indirectly (by viewing the firm efficiency (Glautier & Underdown (2001) suggests that the pension funds that lack administrative grip lose their market position and contributors. Schreiner (2000) reports that the profits significantly impact sustainability and profits are affected by poor administrative management, i.e., high administrative expenses. Hauner et al., (2007); CGAP (2003); Adongo & Stork, (2006), and several studies have been conducted showing negative relation of administrative expenses upon financial sustainability of various countries. To test the scenario in the context of OECD countries, the study postulates the following hypothesis;

H8: Administrative expenses have a negative impact on the financial sustainability of pension funds management companies in Turkey.

1.10. Effective tax rate and Financial Sustainability

Tax is the amount that is paid to the government for the welfare of society. Tax authorities in the world give relaxation to the firms which pay interest on debts. Some governments also provide tax benefits for those established explicitly for society's welfare, such as pension funds or mutual fund schemes. They provide this relaxation because firms' operations are essential for the running of an economy. If they are already paying interest as an expense for running operations smoothly, then no extra burden should be put on the shoulders of the companies. A

firm can benefit from a tax deduction by using more debt or establishing more and more pension fund schemes.

Some researchers argued that firms have positive relation of debt or financial burden with the tax rate (Modigliani & Miller 1963, Antoniou et al., 2008). On the other hand, Antoniou et al. (2008) showed that the tax rate negatively relates to financial debt ratios. He argues that this relation of tax with the financial structure depends on that specific country's tax policies. And some researchers have found no significant relationship between financial sustainability ratios and tax rates (such as Huang and Wang, 2015). This study will try to find the impact of tax rate as a critical determinant of financing on the choice of optimal financial structure of pension funds companies in Turkey. An effective tax rate is calculated as the ratio of paid tax to earnings before tax (Huang & Wang 2006).

In light of the above literature, the study aims to analyze the tax rate upon the following hypothesis;

H9: Effective tax rate has a negative impact on the financial sustainability of pension firms.

2. THEORETICAL FRAMEWORK

This study's theoretical model describes the conceptual model and explains its relations with the prevalent theories in a justifiable manner. Figure-1 below depicts the conceptual model for Micro-Economic Factors. This chart flow explains that micro-economic factors can be subdivided into two categories, i.e., firm-level factors and individual-level factors. Firm-level factors include the size of the firm, age of the pension firm, contributions made by employers and members of a pension fund, board competency and board size of a pension company, operational risk associated with a pension fund, expenses which are incurred for the management of pension funds, and income taxes applied on pension fund companies. According to previous studies, all the above mentioned firm-level factors can affect pension funds' financial sustainability.

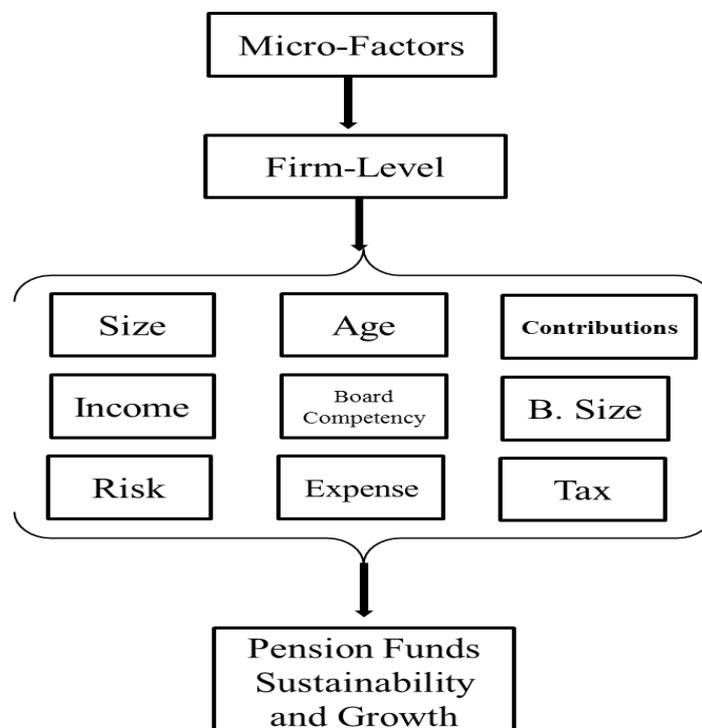


Figure 1 Conceptual Model for Micro-Economic Factors

Under the umbrella of utility theory, a pension fund company must have enough funds to satisfy its clients when they are retired. It is the value of money that should be given to retirees to live easily in their society by adjusting their financial needs. Size is an essential determinant for analyzing the financial sustainability of a firm (Lafourcade, 2005). The size of pension funds' assets must meet their liabilities, and interest on these funds must meet future changes (Theory of Immunization). With time, a firm gets a lot of expertise and market recognition and can be called a sustainable financial firm that can survive even in crucial situations. Any pension company must generate enough contributions to achieve the economies of scale and compete with the larger firms in the market. These contributions either received from employers or members must be large enough to meet the firm's future commitments and market volatility (Institutionists' Approach). These contributions are invested in different suitable opportunities in exchange for an appropriate return. The return or net income generated from these investments should be enough to meet the operational expenses and also to be able to add some value to the total funds (Accounting profitability theory).

The board size should be suitable according to the firm's size. Its operations and board members must include some competent members with some professional background or expertise in funds management (Theory of governance and specialization). While establishing a pension funds company, the fund managers should keep the probability of ruin or bankruptcy as lower as possible to smoothly manage all of their future operations and hence can be financially sustainable in the long run (Ruin Theory). The expenses or costs incurred for managing a pension fund company must be written off from the same year's revenue. Otherwise, there will be a probability of mismatching the financial reports that can lead to financial instability in the future (Concept of Absolute Matching and Revenue Recognition). Lastly, taxes are levied by the government for the welfare of society. If the government gives some tax incentives or tax shields for future savings, it will encourage pension funds growth or vice versa. By using this approach, more and more poor class citizens can be grabbed into future savings that will increase the clients for pension funds companies by making them more sound and sustainable in the future (Welfarists' Approach).

3. DATA AND METHODOLOGY

3.1. Data Collection

For the empirical analysis, data for the firm-level of pension funds companies in Turkey have been collected from different databases such as the Under-secretariat of Turkey, Capital Markets Board of Turkey, and Pension Monitoring Centre. Moreover, the financial statements of each company were also accessed for covering the missing data. There are currently 18 pension funds companies working under the pension regulatory authority of turkey (Ministry of Finance in Turkey). For empirical Analysis, 15 companies were chosen based on the availability of the selected variables' complete data since 2005. The observations were collected for the year-end values published in financial reports of the companies. Three of the 18 companies were not selected due to complete data unavailability for the concerned variables. However, the rest of the companies were scrutinized, and data was collected that showed an unbalanced panel for the study. Annual data were taken starting from the year 2005 to 2017. Types of pension funds companies in Turkey vary according to their size of business. Some companies are working on a larger scale and have more clients. Such as Garanti, Allianz, Anadolu, Avivasa had a combined market share of 66%, and their assets under the management count for 74% of the whole market.

3.2. Variables and Their Measurement

Table-2 in the appendix depicts the study variables, along with their method of measurement based upon the past literature.

3.3. Techniques used for Analysis

In the literature, different techniques for analyzing the effect of different factors on pension funds sustainability and growth determinants are observed. In this perspective, some researchers have used multiple regression techniques (Hauner, Daniel & Michael, 2007; Brau & Woller, 2004; and Chaves & Gonzalez-vega, 1996) whereas others have used panel data techniques (Bodie et al., 2009; Glautier & Underdown, 2001; Porwal, 2001). This study will also use panel data techniques such as pooled OLS, fixed effect, and random effect approach to make a comparative analysis of observed variables on the financial sustainability of pension funds. A panel data is used for Analysis as it has qualities of both time series and cross-sectional data.

The following equations show the types of panel data approaches for empirical Analysis

$$y = mx + c \quad (a)$$

The equation (a) shows the basic mathematical model for deriving required equations where y is the dependent variable, x is a vector of independent variables, m is a vector of coefficients, and c is included as a constant term.

$$y = c + mx + e \quad (b)$$

Equation (b) refers to the pooled data model for empirical Analysis, and e represents the error term in the data.

$$y_{it} = C_{it} + mx_{it} + e_{it} \quad (c)$$

Equation (c) describes the fixed effect panel data approach, where all the unobserved factors are included in the constant term. However, when we assume that all unobserved factors are not included in the constant term, they are included in the error term; it is called a random effect approach.

$$y_{it} = C_0 + mx_{it} + e_{it} + \varepsilon_{it} \quad (d)$$

This study will check the better option for analysis, i.e., choosing a fixed or random effect approach by applying the Hausman specification test.

3.4. Economic Model

The following model provides the general economic functions of this study. Equation (1) describes a pension fund company's financial sustainability as a function of firm-level micro-economic factors that may influence the growth of pension funds. Moreover, these firm-level-micro factors are further elaborated in equation (2), which describes that these factors are the size of the firm, age of the firm, contributions made by employers and members, the income of the company, board size, and board competency of the company, operational risk faced by a company, expenses incurred to generate revenue and taxed paid to the government for the welfare of the society.

$$FS = f(\text{firm} - \text{level} \text{ micro} - \text{economic} \text{ factors}) \quad (1)$$

$$FS = (FS_{t-1}, \text{Size}, \text{Age}, \text{Contri}, \text{Income}, \text{B. Size}, \text{B. Comp}, \text{Risk}, \text{Exp}, \text{Etax}) \quad (2)$$

3.5. Econometric Model

Based on the above-described model, a dynamic panel data approach was used, and the following three equations show the econometric models for this study, i.e., the first model shows the pooled-OLS techniques, the second model shows the random effect, and the third model shows the fixed-effect model for empirical analysis of the study.

$$FS_{it} = \beta_0_{it} + \beta_1 (FS)_{i,t-1} + \beta_2 (FS)_{i,t-2} + \beta_3 (Size)_{it} + \beta_4 (Age)_{it} + \beta_5 (Contributions)_{it} + \beta_6 (Income)_{it} + \beta_7 (B. Size)_{it} + \beta_8 (B. Comp)_{it} + \beta_9 (Risk)_{it} + \beta_{10} (Expenses)_{it} + \beta_{11} (E. Tax)_{it} + \varepsilon_{it} \text{---Pooled OLS} \quad (3)$$

$$FS_{it} = \beta_0_{it} + \beta_1 (FS)_{i,t-1} + \beta_2 (FS)_{i,t-2} + \beta_3 (Size)_{it} + \beta_4 (Age)_{it} + \beta_5 (Contributions)_{it} + \beta_6 (Income)_{it} + \beta_7 (B. Size)_{it} + \beta_8 (B. Comp)_{it} + \beta_9 (Risk)_{it} + \beta_{10} (Expenses)_{it} + \beta_{11} (E. Tax)_{it} + (\alpha_i + \varepsilon_{it}) \text{---RE} \quad (4)$$

$$FS_{it} = \beta_0_{it} + \alpha_i D_{it} + \beta_1 (FS)_{i,t-1} + \beta_2 (FS)_{i,t-2} + \beta_3 (Size)_{it} + \beta_4 (Age)_{it} + \beta_5 (Contributions)_{it} + \beta_6 (Income)_{it} + \beta_7 (B. Size)_{it} + \beta_8 (B. Comp)_{it} + \beta_9 (Risk)_{it} + \beta_{10} (Expenses)_{it} + \beta_{11} (E. Tax)_{it} + \varepsilon_{it} \text{---FE} \quad (5)$$

4. RESULTS ANALYSIS AND DISCUSSION

Table-3 in the appendix describes the descriptive part of the study which includes observations, mean, standard deviation, minimum and maximum values of the concerned variables of the study. A total of 15 companies were taken for 13 years making total observations of 195 making it balanced panel data.

The table-4 in the appendix represents the correlation matrix of the concerned variables of the study. It shows that the variables such as size, age, contributions, income, and board composition have a positive and significant relationship with a pension fund company's financial sustainability. These values are significant at a 5% level and have correlation coefficients as 0.115, 0.201, 0.213, 0.105, and 0.203, respectively.

On the other hand, the board size, risk, expenses, and effective tax rate negatively and significantly affect the pension fund company's financial sustainability. These are all significant at a 5% level of significance and having the correlation coefficients as -0.132, -0.613, -0.081, and -0.302, respectively. The column of variance inflation factor (VIF) shows no multicollinearity problem in the data as all the included variables have the value of VIF less than 10.

Table-5 below describes a comparative analysis of pooled OLS, random effect, and fixed effect regression analysis of this study's observed data. It is evident from the R-squared values of the three models that the overall included variables in the study explain the change in financial sustainability as 44.95%, 43.15%, and 44.07%, respectively.

4.1. Prior Financial Sustainability

If the firm is prior financially sustainable, it will positively impact future growth and sustainability. The prior FS with one year lag of the firm shows a positive and significant relationship at 5%, 1%, and 5% of significance in FE, RE, and Pooled-OLS, respectively, with the current financial sustainability of pension fund companies in Turkey. It describes that if a firm's FS is increased by one percent in the previous year, the financial sustainability of next year will also be increased by 0.12%, 0.13%, and 0.12% in all three models, respectively.

If the firm is FS within the last two years, then the effect on the current year's financial sustainability will be more pronounced at 1%, 5%, and 10% levels of significance in FE, RE, and Pooled-OLS, respectively. It shows that if a firm's FS is increased by one percent in the last two consecutive years, the current year's financial sustainability will also be increased by 0.32%, 0.32%, and 0.22% in all three models, respectively. In sum, we can say that if a firm

has been financially sustainable for the last many years, then there is a very strong chance that it will continue to remain in its position as financially sustainable in the forthcoming years. These results are consistent with the studies of Adams and Larriga (2007); Adams and McNicholas (2007), and Barr and Diamond (2006). It also supports the theory of pooling and theory of utility because pooling or combining individual assets will make it easy to invest in diversifies and large assets. Moreover, if a company's previous years' performance is better, it means it has the utility to satisfy its retirees and meet its short-term and long-term obligations.

4.2. Size

The firm's size shows a positive and significant relationship at 1%, 5%, and 5% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if the firm's size is increased by one percent, the pension fund company's financial sustainability will also be increased by 0.22%, 0.19%, and 0.14% in all three models, respectively. This relationship is also supported in the literature by Haunerl et al. (2007); Bogan et al. (2007) and Mersland & Storm (2009); (Kyereboah & Osei 2008).

Table 5 FE, RE and Pooled Regression Analysis of Data

DV-FS	Fixed Effect	Random Effect	Pooled-OLS
FS-Lag1	0.1259** (0.16)	0.1336*** (0.25)	0.1201** (0.03)
FS-Lag2	0.3241*** (0.13)	0.3216** (0.15)	0.2203* (0.14)
L. Size	0.2239*** (0.06)	0.1939** (0.15)	0.1402** (0.01)
Age	0.0296** (0.11)	0.3236* (0.04)	0.0243* (0.13)
L. Contributions	0.2117*** (0.05)	0.2014* (0.13)	0.2354** (0.03)
L. Income	1.1477*** (0.16)	1.2473** (0.42)	0.1304** (0.24)
B. Competency	0.3458** (0.12)	0.2453* (0.11)	0.2394** (0.06)
B. Size	-0.0077 (0.01)	-0.1027 (0.14)	-0.0213** (0.01)
Risk	-0.0291** (0.02)	-0.3244*** (0.13)	-0.0168* (0.05)
L. Expenses	-0.0778** (0.03)	-0.1738*** (0.1)	-0.0132** (0.16)
E. Tax	-0.1124*** (0.03)	-0.2123* (0.08)	-0.0399** (0.02)
Dummy for 2008 FC	-0.0175** (0.13)	-0.0153** (0.12)	-0.0131* (0.16)
Cons	4.8422*** (0.24)	5.2442* (0.77)	3.8395** (0.01)
R2	0.4495	0.4315	0.4407
F-Value	61.55***	60.21***	61.46***

Hetero (P-value)	0.2984	0.3012	0.2844
Serial Auto (P-value)	0.1899	0.2421	0.1789
AIC	394.03	394.86	395.76
BIC	392.84	393.41	393.04
Hausman (P-value)	0.0247		
*, **, *** show statistically significant at the 10%, 5% and 1% levels, respectively.			

It also provides sustenance to the theory of immunization and the Institutionists' approach because the pension funds should be large enough to meet its future liabilities and meet its day-to-day operations. So that it should not be a burden on the shoulders of the government or society. In Turkey, some firms are enormous and have many clients due to their renowned worldwide, such as Allianz Hayat ve Emeklilik, BNP Paribas Cardiff Emeklilik, and Avivasa Emeklilik. They cover more than 60% of the market share and provide up to the mark services. However, some companies are still in the lower part of the market because of fewer contributors.

4.3. Age

The firm's age shows a positive and significant relationship at 5%, 1%, and 1% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if the firm's age is increased by one unit, the pension fund company's financial sustainability will also be increased by 0.03, 0.32, and 0.024 units in all three models, respectively. This relationship is also supported in the literature by (Hauer et al., 2007; Gonzalez, 2007; and CGAP, 2009).

This relationship of age and financial sustainability of a pension company supports the application of life-cycle theory. According to this theory, new entrants in the market will grow faster because of its increasing market share with time unless it gets maturity. Turkey has a great potential for absorbing a massive population to the pension funds in the coming future. Hence, with time, if pre-established firms will provide a better yield to maturity with a guarantee, then it will automatically capture more share in the market. In Turkey, some firms are substantial in size and have many clients due to their early start, such as BNP Paribas Cardiff Emeklilik and Avivasa Emeklilik. They cover more than 45% of the market share and provide up to the mark services.

4.4. Contributions

The firm's contributions show a positive and significant relationship at 1%, 10%, and 5% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if a firm's contributions are increased by one percent, the pension fund company's financial sustainability will also be increased by 0.21%, 0.20%, and 0.23% in all three models, respectively. This relationship is also supported in the literature by (Rutherford 1995; Borella & Fornero 2007; Rauh 2006).

The positive relationship between contributions and financial sustainability supports the theory of pooling, Keynesian's saving theory, human capital spill-over theory. Firstly, according to the pooling theory, individual investors cannot escape from market volatility and also cannot employ the diversification strategy; that is why they make combine contributions for making a better investment. Secondly, according to Keynesian's saving approach, if more and more people are forced to make future savings, it will positively impact economic growth. It will provide financially sustainable returns to investors. Thirdly, according to the 'human capital spill-over theory,' to support the pay-as-you-go (PAYG) system, the current generation must contribute more to provide better returns to their elders. In Turkey, Allianz Hayat ve Emeklilik,

BNP Paribas Cardiff Emeklilik, and Avivasa Emeklilik firms are very large and have many clients. Due to that, they can generate a considerable amount of contributions from their members and employers.

4.5. Income

The firm's income shows a positive and significant relationship at 1%, 5%, and 5% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if the firm's income is increased by one percent, the pension fund company's financial sustainability will also be increased by 1.14%, 1.25%, and 0.13% in all three models. This relationship is also supported in the literature by (Shreiner, 2002); (Von Pischke, 1996; Woller & Schreiner, 2002; CGAP, 2005; Adongo & Stork, 2006; Armendariz & Mordach, 2007; Hauner et al., 2007; and Gonzalez-vega, 2007).

The positive relationship between income and financial sustainability also supports the accounting profitability theory and immunization theory. Firstly, according to the accounting profitability theory, the firm should be efficient means that it should provide the maximum output by using minimum resources. It shows that it must be able to meet all its expenses with its revenues. Secondly, according to the theory of immunization, the firm must generate stable funds over the long-run so that it can adjust the changes occurred due to changes in interest rates or by paying its short-term and substantial liabilities. In Turkey, most companies generate a stable income and can meet their short-term and substantial liabilities.

4.6. Board Competency

The firm's 'board competency' shows a positive and significant relationship at 5%, 10%, and 5% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if a firm's 'board competency' is increased by one unit, the pension fund company's financial sustainability will also be increased by 0.35, 0.24, and 0.24 units in all three models, respectively. This relationship is also supported in the literature by (Yermack 1996; Xie et al. 2003) and (Garcia, Garcia & Penalva; 2005).

The theory of governance and specialization supports the positive relationship between the company's board competency and financial sustainability. According to this theory, if the board will be competent and have good external relations, it will eventually benefit the company's growth and sustainability. In Turkey, some firms have competent and expert board members, and due to this reason, they are comparatively working efficiently and can capture more market share.

4.7. Board Size

The size of the firm is showing a negative and insignificant relationship in the first two models. However, it shows a negative and significant relationship 5% levels of significance in Pooled-OLS with the financial sustainability of pension fund companies in Turkey. It describes that if the firm's board size is increased by one unit, the pension fund company's financial sustainability will also be decreased by 0.0213 units, respectively. This relationship is also supported in the literature by (Sanda, Mikailu, and Garba, 2005); (Yermack, 1996; Xie et al., 2003).

There is weak evidence that the board's size is negatively associated with the financial sustainability of the pension funds companies. According to the theory of governance, there should be an appropriate board of directors to govern the matters of the company. However, it cannot be said that if the board is oversized, then it will not work correctly to achieve the organizational goals. In Turkey, some firms have many BODs due to their large scale operations

and are working efficiently. On the other hand, some companies have only a few board members, working slower.

4.8. Risk

The firm's risk shows a negative and significant relationship at 5%, 1%, and 10% levels of significance in FE, RE, and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if a firm's operational risk is increased by one unit, the pension fund company's financial sustainability will be decreased by 0.03, 0.32, and 0.02 units in all three models, respectively. Good governance can also bring indirect benefits to pension funds. It can spare them the costs of overregulation, and it can facilitate supervision by the authorities. The stronger the fund's governance, the better the risks (such as operational risk, investment risk) will be managed and controlled. This relationship is also supported in the literature by Whelan (2004) and Clapman (2007).

It also provides sustenance to the theory of risk, i.e., Ruin theory. According to this risk theory, the pension fund or insurance company must have a substantial amount of surplus in hand to meet its urgent and long-term obligations. If the company fails to do so, it may have to face ruin or insolvency. Hence, the continuous operational risk can lead to the company's distress situation and can harm its financial sustainability.

4.9. Expenses

The firm's operating expenses show a negative and significant relationship at 5%, 1%, and 5% levels of significance in FE, RE and Pooled-OLS, respectively, with pension fund companies' financial sustainability in Turkey. It describes that if a firm's operating expenses are increased by one percent, the pension fund company's financial sustainability will be decreased by 0.08%, 0.17% and 0.01% in all three models, respectively. This relationship is also supported in the literature by (Shankar, 2007; Hauner et al., 2007 and Knell, 2005).

It also supports the revenue recognition concept of accounting that revenue or contributions, whether received or not, should be recorded in time. Moreover, according to pooling theory, if investments are made collectively, transaction costs will be lower, and pool-fund can be utilized to invest in expensive assets. However, if administrative or financial expenses exceed a specific limit, it will have a negative impact on the company's profitability that may hamper financial sustainability in the long-run. The insurance association and ministry of Turkey's finance make it possible by regulations to keep the transaction cost as low as possible.

4.10. Effective Tax Rate

The firm's 'effective tax rate' shows a negative and significant relationship at 1%, 10%, and 5% levels of significance in FE, RE and Pooled-OLS, respectively, with pension fund companies' financial sustainability Turkey. It describes that if the firm's significant tax rate increases by one percent, the pension fund company's financial sustainability will also be increased by 0.11%, 0.21% and 0.04% in all three models, respectively. This relationship is also supported in the literature by (Schreiner 2000; Davis, 1997) and the International Federation of Pension Fund Administrators (2003).

The Welfarists' approach supports this relationship. Suppose the government will increase taxes on the established pension funds management companies. In that case, it will accumulate a lower profit for the company and resultantly reduce its ability to meet its short-term and substantial long-term liabilities. However, the Turkish government has passed a rule by lowering retirees' tax burden in 2013 that boosted the number of clients to register themselves in a pension scheme.

4.11. Financial Crisis

It is also important to note that a dummy variable for the 2008 financial crisis was introduced in the model. It shows that the financial crisis disturbed the financial sustainability of the pension funds companies in Turkey. The coefficients are negative and significant at 5%, 5% and 10% in FE, RE, and Pooled-OLS. It describes that a 1% increase in the crisis will reduce financial sustainability by 0.017%, 0.015%, and 0.013%, respectively.

It happened because the Turkish economy is severely disturbed by the attack of the financial crisis. However, the Turkish government took prompt actions to curb the situation. Due to prudent monetary and fiscal policy, Turkey came out of the distressing situation earlier than other European countries (Berkmen, P. ve diğeri, 2011; Eichengreen, B. 2010).

5. CONCLUSION

A dynamic panel data regression model was applied. Results indicate that two lagged values of the financial sustainability, size and age of the firm, contributions, income, and board competency have a significant and positive effect on the pension funds company's financial sustainability. On the other hand, the board size, operational risk, operating and administrative expense, effective tax rate, and financial crisis of 2008 negatively affect the pension fund company's financial sustainability. The fixed effect approach performs best based on R-square, F-value and AIC. However, using random effect and pooled-OLS also provide somehow similar significant results. Still, their R-square, F-test and AIC values do not prioritize them over the fixed-effects approach.

The results obtained from the dynamic panel data regression model also support the previous research work and the pre-established theories such as pooling, utility theory, Institutionists approach, theory of immunization, life-cycle theory and accounting profitability theory, ruin theory and theory of governance. In sum, we can say that the above mentioned and described firm-level micro-economic factors have a significant and contributory effect on the financial sustainability and growth of pension funds companies in Turkey.

6. RESEARCH IMPLICATION OR CONTRIBUTION

For empirical analysis, it considers all the pension funds companies of Turkey as a sample of this study. It includes essential variables of firm-level that have a strong influence on the growth of pension funds. It supports the pre-established theories of pension funds, such as the theory of pooling and immunization theory.

Results can be used by the ministry of Turkey's finance for making the procedures more efficient and effective for covering the whole market. The regulatory authorities can look at the variables that are negatively affecting the growth of pension funds such as operating and legal expenses, board size, tax rate, etc. and can suggest policy recommendations to fix them. Capital markets board can take precautionary measures to face any challenges such as that were occurred after the 2008 financial crisis.

7. RESEARCH LIMITATIONS AND FUTURE RECOMMENDATIONS

It covers the data from 2005-2017 of 15 pension funds companies. However, it can be extended by collecting semi-annual or quarterly observations. This research limits the only pension funds companies working in Turkey. However, a comparative analysis can be conducted by using cross-country data. Further research can be conducted to analyze the difference of opinion about Islamic-approach-based pension funds followed in Turkey with other traditional types of pension funds.

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APPENDIX**Table 1** Firm-Level Micro-Economic Factors

Symbol	Variable	Expected Relation	Literature Review	Supporting Theory
FS	Financial Sustainability	DV	Thapa et al.,1992)	Utility Theory and Institutionists Approach
Size	Size of firm	Positive	Marsland and Storm, (2009) Lafourcade (2005)	Theory of Immunization
Age	Age of firm	Positive	Knell, (2005); Woller (2000)	Life-Cycle Theory
Contri	total contributions	Positive	Heeder, K. (2010)	Theory of pooling, Keynesian's Saving Theory
Income	EBIT	Positive	Knell, (2005); Hauner et al, (2007)	Accounting Profitability Theory
Bcomp	Board Competency	Positive or Negative	Chtourou et al., (2001); Park & Shin (2004)	Theory of Governance and Specialization
Bsize	Board Size	Positive or Negative	Xie et al., (2003); Zhou and Chen (2002)	Theory of Governance
Risk	Operational Risk	Negative	Baranoff et al., (2007); Eldomiaty, (2007)	Ruin Theory
Expenses	Admin. Expenses	Negative	Adongo & Stork, (2006); Schreiner (2000)	Absolute Matching or revenue recognition
E Tax	Effective tax rate	Negative	Antoniou et al. (2008); Huang & Wang (2006)	Welfarists' Approach

Table 2 Firm-Level Micro-Economic Factors

Symbol	Variable	Literature Review	Measurement
FS	Financial Sustainability	(Thapa et al., 1992)	It is measured as the ratio of short-term and long-term liabilities to a pension fund company's total assets.
Size	Size of firm	Mersland & Storm, (2009); Lafourcade (2005)	By taking the natural log of revenue of a pension fund company.
Age	Age of firm	Knell, (2005); Woller, (2000)	When a pension fund company started its operations in Turkey under the Act of Pension 2003.

Symbol	Variable	Literature Review	Measurement
Contri	total contributions	Heeder, K. (2010)	It is a sum of contributions received from employers and members of a pension fund scheme.
Income	EBIT	Knell, (2005); Hauner et al., (2007)	Earnings before interest & tax are taken as the Income variable of a pension fund company.
Bcomp	Board Competency	Chtourou et al, (2001); Park & Shin, (2004)	It is measured as the ratio of expert board members to the total number of members in a board.
Bsize	Board Size	Xie et al., (2003); Zhou and Chen, (2002)	The total number of directors on a board is known as board size.
Risk	Operational Risk	Baranoff et al., (2007); Eldomiaty, (2007)	It is measured as the ratio of the percentage change in EBIT to the percentage change in sales.
Expenses	Admin. Expenses	Adongo & Stork, (2006); Schreiner (2000)	It is measured as the total expenses incurred on pension funds management, including administrative and legal expenses.
Etax	Effective tax rate	Antoniou et al. (2008); Huang & Wang (2006)	It is measured as the ratio of paid tax to the earnings before tax.

Table 3 Descriptive Statistics

Variable	Obs.	Unit of Measurement	Mean	Standard Deviation	Minimum	Maximum
FS	195	Percentage	0.4261	1.223	0.21	3.43
Size	195	TL (Millions)	112.528	118.74	123.37	1720.11
Age	195	Years	7.223	10.782	3	15
Contributions	195	TL (Millions)	895.679	1668.552	1390	3896.53
Income	195	TL (Millions)	516.24	251.56	167.87	1928.34
B. Comp	195	Percentage	0.455	0.239	0.023	0.935
B. Size	195	Numbers	13.24	17.56	5	29.23
Risk	195	Percentage	2.289	24.93	-16.41	23.03
Expenses	195	TL (Millions)	334.3	229.606	76.21	952.74
E-Tax	195	Percentage	0.362	2.457	-0.42	4.52

Table 4 Correlation Matrix of Variables

Variables	VI F	FS	Size	Age	Contri	Income	Bcomp	Bsize	Lrisk	Expenses	Letax
FS		1									
Size	7.92	0.115*	1								
Age	2.58	0.201*	0.023	1							
Contri	6.55	0.213*	0.550*	0.064*	1						

Variabl es	VI F	FS	Size	Age	Cont ri	Inco me	Bcom p	Bsize	Lris k	Expens es	Leta x
Income	6.3 2	0.105 *	- 0.119 *	- 0.036 *	- 0.178 *	1					
Bcomp	5.4 4	0.203 *	- 0.031	- 0.042	- 0.052	- 0.049 *	1				
Bsize	3.9 8	- 0.132 *	0.053	- 0.074 *	0.037	- 0.074 *	- 0.107	1			
Lrisk	1.9 9	- 0.613 *	0.031	0.086	0.052	- 0.614 *	- 0.041	- 0.008	1		
Expense s	3.7 8	- 0.081 *	- 0.044 *	- 0.051	0.561	- 0.438 *	0.218	- 0.004 *	0.04 6	1	
Letax	1.3 2	- 0.302 *	- 0.059	- 0.042	- 0.001	- 0.623 *	- 0.064	- 0.034	0.06 7	-0.065	1
* shows significance at the .05 level											