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Exploring the Drivers of Pension Fund Growth: An Empirical Study of Direct and Indirect Factors in OECD Economies

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ABSTRACT

Purpose – The purpose of the study is to investigate the relationship between pension funds' growth and macro factors like dependency ration, replacement rate, average wage, working wage etc. The study aims to demonstrate the variation observed in behavior of these factors in high and low growth-oriented OECD countries and helps to have better understanding of the macro factors to support huge asset holding financial sector of OECD economies.

Design/methodology/approach – To bring out the core macro factors determining pension fund growth hierarchical regression technique was used on dynamic panel data model to check the individual significance of included variables in the model progressively and for this purpose R^2-change was observed.

Findings – The study explores that OECD economies behave differently on the bases of their growth perspective i.e. Average Age, Working Wage, Personal Income Tax and Inflation are positively contributing to pension funds in HGO economies and negative in LGO ones.

Originality/value – The approach used in the paper could be of practical benefit to policy makers and data analysts of OECD pension funds departments in their decision-making regarding pension fund management and core determinants behind it. The macroeconomic factors used in the study have been identified by going through a literature survey of research carried out in various economies. Therefore, the study could be applicable in different economies at a time for a cross-country analysis of pension funds growth.

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1 Introduction

The sustainability of pension funds has become a pressing issue in modern economies. With populations aging rapidly and dependency ratios rising, governments and societies face increasing pressure to ensure adequate financial security for retirees. Pension funds, which are intended to provide income after retirement, are therefore crucial for the well-being of citizens, particularly the elderly, as they safeguard against risks such as unemployment, income loss, and longevity.

Despite their importance, pension funds are under strain from demographic challenges and macroeconomic fluctuations. Higher life expectancy, lower fertility rates, and volatile economic conditions raise concerns about whether pension funds can continue to grow sufficiently to meet future obligations. This problem is especially critical in OECD countries, where pension funds represent a significant share of the financial sector and play a vital role in economic stability.

While prior research has investigated pension fund governance, performance, and broad demographic influences, less attention has been given to the comparative role of specific macroeconomic determinants—such as dependency ratios, replacement rates, wages, savings, and taxation—in shaping pension fund growth across countries with different growth patterns. Existing OECD reports are largely descriptive and focus on aggregate statistics, offering limited insights into how these determinants function differently in high-growth versus low-growth contexts. This study seeks to fill that gap.

Pension funds serve as institutional investors by pooling contributions from sponsors and beneficiaries to provide retirement income (Davis, 1995). Their long-term investment strategies typically restrict early withdrawal, enabling allocation across a diverse set of assets including equities, bonds, and real estate to maximize returns. Given their role in holding substantial assets within OECD economies (OECD, 2017), understanding the key drivers of pension fund growth is both economically and socially significant.

This research analyzes the macroeconomic determinants of pension fund growth in OECD countries using panel data from 24 nations over a 43-year period. Countries are divided into two groups—higher-growth-oriented (HGO), with pension funds-to-GDP ratios above the median, and lower-growth-oriented (LGO), with ratios below the median. By distinguishing between these two groups, the study provides a comparative perspective on how macroeconomic factors operate differently depending on country growth dynamics.

Literature Background and Hypotheses Development

Based up on past academic literature the study highlights some macroeconomic variables that influence the growth of the pension fund, the section below (Table-1) develops plot of each variable into the shape of a hypothesis for analysis.

Table-1: Summary of Supporting Theories

Macro-Economic Determinants of Pension Funds' Growth

Symbol	Variable	Expected Relation	Literature Review	Supporting Theory
PFG	Pension Funds Growth	P/N	McDonnell, C. (2024); Roce, Kaminker, & Stewart (2011); Casey, (2014); Alonso, et al. (2010); Singh & Mehta, (2015); Açıkgöz, Uygurtürk, & Korkmaz, (2015)	Utility Theory+ Institutionists Approach+ Theory of Immunization

DR	Dependency Ratio	N	Yüksel et. al., (2025); Magnus, (2012); Lee, (2011); Horioka, & Wan, (2007); Godlee, (2013); Horioka, & Terada-Hagiwara, (2012)	Theory of Contribution Density
RR	Replacement Rate	N	Martí-Ballester, (2024); Worrall, & Appel, (1982); Lin, & Ding, (2007); Zaigui, (2008); Gustman, & Steinmeier, (1999); Yang, (2009); Aldrich, (1982)	Theory of Contribution Density
AGW	Average Wage	P/N	Diaz, & Hansen, (2025); Galí, & Monacelli, (2016); Daly, & Hobijn, (2017); Feldstein, (2018); Ruhs, & Vargas-Silva, (2015); Adrjan, & Bell, (2018)	Theory of Pooling
WRK	Working Age	P/N	Ajadi, (2024); Hinrichs, (2018); Vogel et al. (2017); Drucker, (2017); Curran, & Blackburn, (2001); Scherger, (2016)	Life-Cycle Theory
ER	Employment Rate	P	Irfan, & Lau, (2024); Evensen et al. (2015); Möhring, (2015); Beveridge, (2014); Banerjee, & Blau, (2016); Laun, & Wallenius, (2015)	Theory of Pooling
SR	Saving Rate	P	Garrett, (2024); Imrohoroğlu, & Zhao, (2018); Lachowska, & Myck, (2018); Blau, (2016); De Freitas, N. E. M., & Martins, (2014); Börsch-Supan et al. (2015)	Theory of Pooling
PTR	Personal Income Tax Rate	P/N	Asiedu et. al., (2024); Parker, (2018); Grubert, & Altshuler, (2015); Karamcheva, & Sanzenbacher, (2014); Feldstein, (2018); Collins, & Hughes, (2017)	Welfarists Approach
GDPG	GDP Growth Rate	P	Gevorgyan & Hovhannisyan, (2025); Scharfstein, (2018); Been et al. (2017); Heer, & Irmen, (2014); Bijlsma, Van, & Haaijen, (2014); Frost et al. (2018); Arbatli (2017); Cingano, (2014)	Growth-Led Finance
EXR	Exchange Rate	N	Liu, Sun, & Xiao, (2024); Galí, & Monacelli, (2016); Gabaix, & Maggiori, (2015); Ezeanyeji (2016); De Vita, (2014); Adeniran, Yusuf, & Adeyemi, (2014); Dimpfl, & Schmidt, (2018)	Purchasing Power Parity
CPI	Consumer Price Index	P/N	Liu, Sun, & Xiao, (2024); Budd, & Seiders, (1971); Pensions Commission. (2004); Thompson, (1978); Heller, (1980); Prammer, & Reiss, (2015); Bivens, (2015)	Theory of Immunization

Theoretical Framework

This study's theoretical framework outlines the conceptual model, emphasizing the intentional connections between the included variables and their resulting influence on dependent variables. Figure 2 illustrates the macroeconomic factors and how they affect the expansion of pension funds within specific OECD countries.

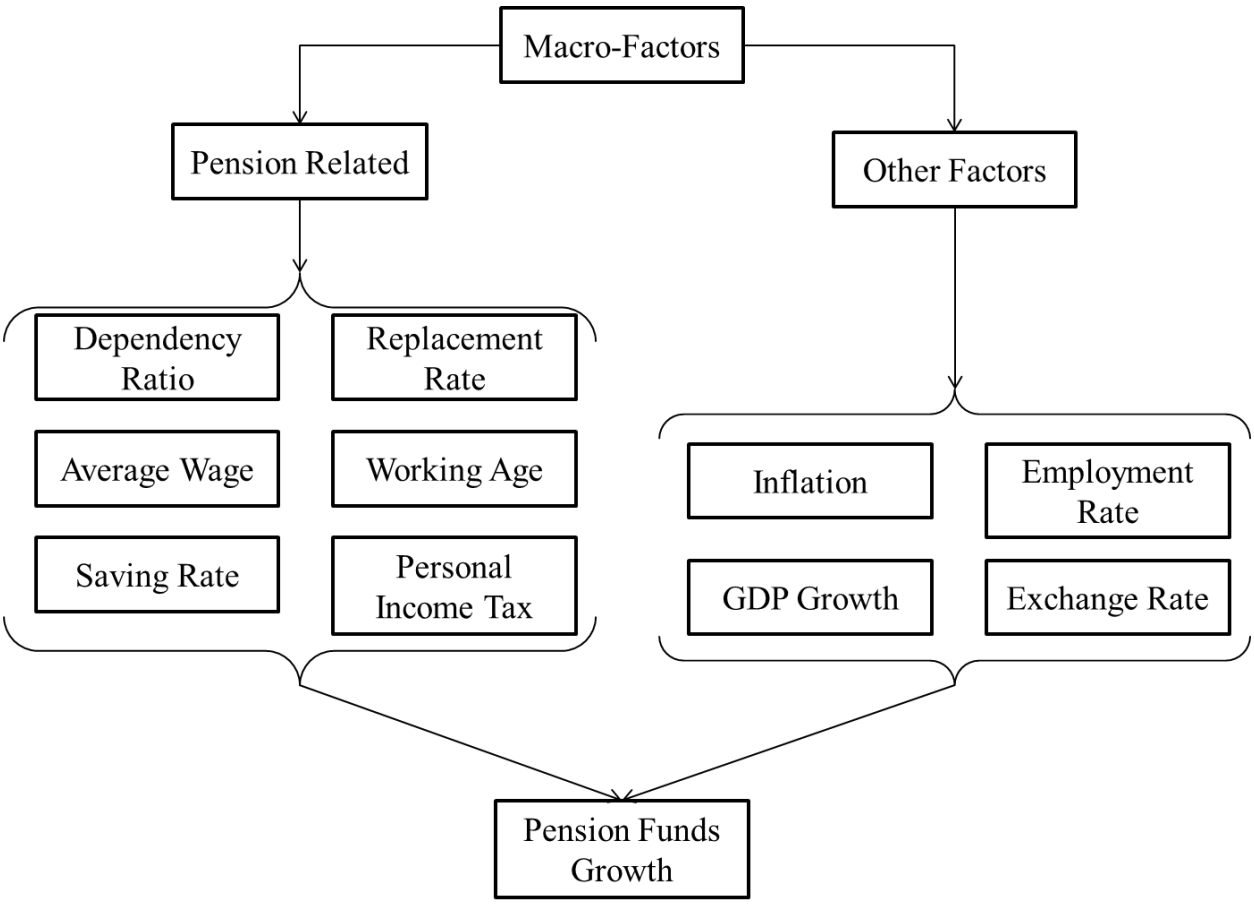


Figure-01: Conceptual Model for Macro-Economic-Factors and Their Impact on the Growth of Pension Funds.

Source: Author's Compilation

The macro-economic factors are mentioned that affect the growth of pension funds. On the basis of the literature, these factors are divided into two major categories i.e. pension related macro-economic factors and other macro-economic factors that have an indirect impact on the growth of pension funds. Pensions related factors include dependency ratio, replacement rate, average wage, working age, savings rate, and personal income taxes. However, other related macro-economic factors are inflation, employment rate, GDP growth, and exchange rate. The prevailing relevant theories that support the above-mentioned macro-economic factors are described in table 2.

Table-2: Unit of Measurement for Variables of the Study

Macro-Economic Determinants of Pension Funds in Selected-OECD Countries

Sign	**Variables**	**Dimension**	**Formula to Measure**
PFG	Pension Funds Growth	Percentage	(Current year funds-previous years funds)/ Previous year funds*100 from OECD Library Data. Singh & Mehta, (2015); Açıkgöz, Uygurtürk, & Korkmaz, (2015)
DR	Dependency Ratio	Percentage	DR= (0-14Y + Over-65Y)/ (15-64Y) *100. Godlee, (2013); Horioka, & Terada-Hagiwara, (2012)
RR	Replacement Rate	Percentage	Percentage of a Worker's pre-retirement income that will be granted as pension after retirement. Yang, (2009); Aldrich, (1982)

AGW	Average Wage	Percentage	Sum of all the annual salaries or wages of working group/ total working population. Ruhs, & Vargas-Silva, (2015); Adrjan, & Bell, (2018)
WRK	Working Age	Years	The number of years a person is eligible to work. Curran, & Blackburn, (2001); Scherger, (2016)
ER	Employment Rate	Percentage	Total number of employed people/ Total labour force*100. Banerjee, & Blau, (2016); Laun, & Wallenius, (2015)
SR	Saving Rate	Percentage	(Total Income-Total Spending)/(Total Income)*100. De Freitas, N. E. M., & Martins, (2014); Börsch-Supan et al. (2015)
PTR	Personal Income Tax Rate	Percentage	As prescribed by taxation rules of each respective country's government. Feldstein, (2018); Collins, & Hughes, (2017);
GDPG	GDP Growth Rate	Percentage	(Current GDP-Previous GDP)/(Previous GDP)*100. Arbatli (2017); Cingano, (2014)
EXR	Exchange Rate	Percentage	Observed Country's Currency/ US Dollars*100. Adeniran, Yusuf, & Adeyemi, (2014); Dimpfl, & Schmidt, (2018)
CPI	Consumer Price Index	Percentage	Rate of Inflation in selected-OECD Countries. Prammer, & Reiss, (2015); Bivens, (2015)

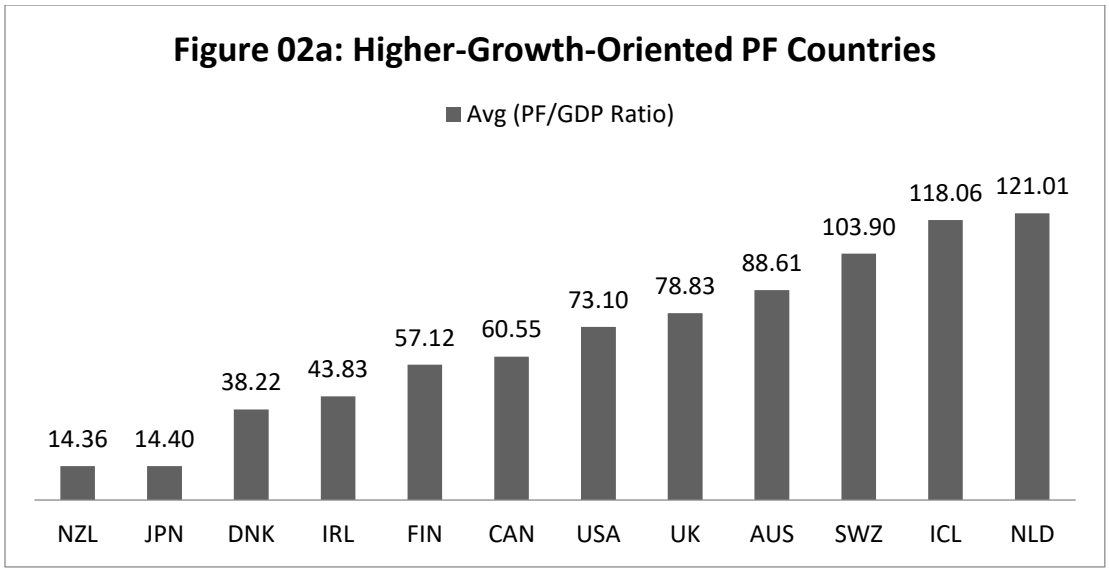
Data and Methodology

Data Collection

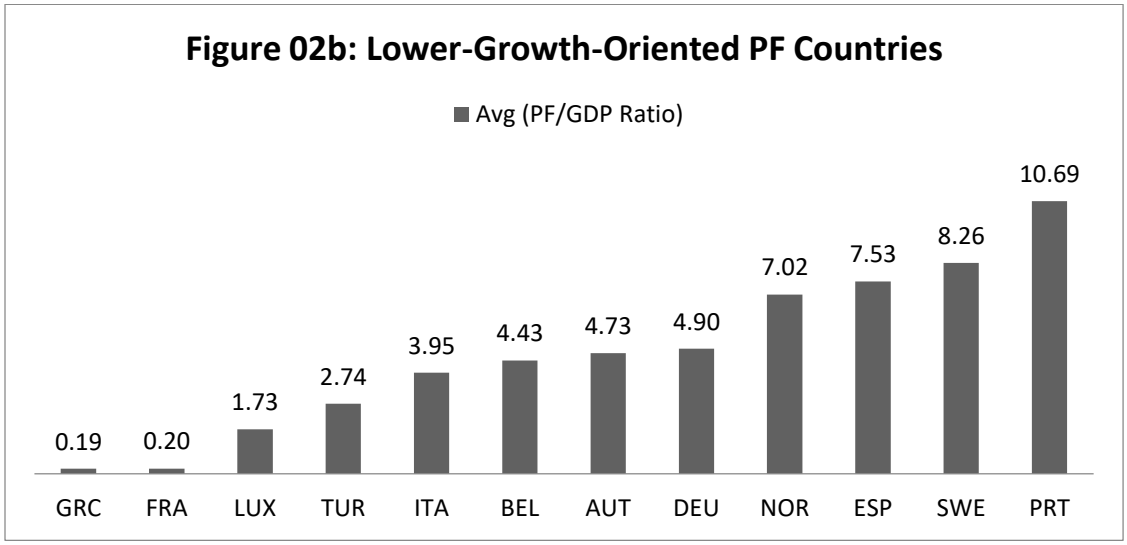
For this study's empirical analysis, data were gathered from various sources, including the OECD data repository, OECD Pension at a Glance publication, and individual country statistical profiles. As of the end of 2018, the OECD comprised 36 member countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the UK, and the USA. Year-end data observations, as of December for each year, were collected.

After careful review, only 24 countries that were OECD members before 1975 were selected. This created a panel dataset of 24 OECD countries with data ranging from 1975 to 2017, resulting in 43 years of observations. This balanced panel data includes a total of 1032 observations. Of the original 36 OECD countries, 12 were excluded due to their membership commencing after 1975. These countries were Mexico, Czech Republic, Hungary, Poland, Korea, Slovak Republic, Chile, Slovenia, Israel, Estonia, Latvia, and Lithuania.

The selected countries were then categorized into two groups based on the median value of their pension funds-to-GDP ratio. This process involved first calculating the average pension funds-to-GDP ratio for each country. Subsequently, the median of these averages was calculated across the 24 countries. Countries with a pension funds-to-GDP ratio above this median were classified as higher-growth-oriented, while the remaining countries with ratios below the median were classified as lower-growth-oriented. The higher-growth-oriented countries are Australia, Canada, Denmark, Finland, Iceland, Ireland, Japan, Netherlands, New Zealand, Switzerland, UK, and USA. The lower-growth-oriented countries are Austria, Belgium, France, Germany, Greece, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, and Turkey (Figure 1a, 1b, and Figure 3).

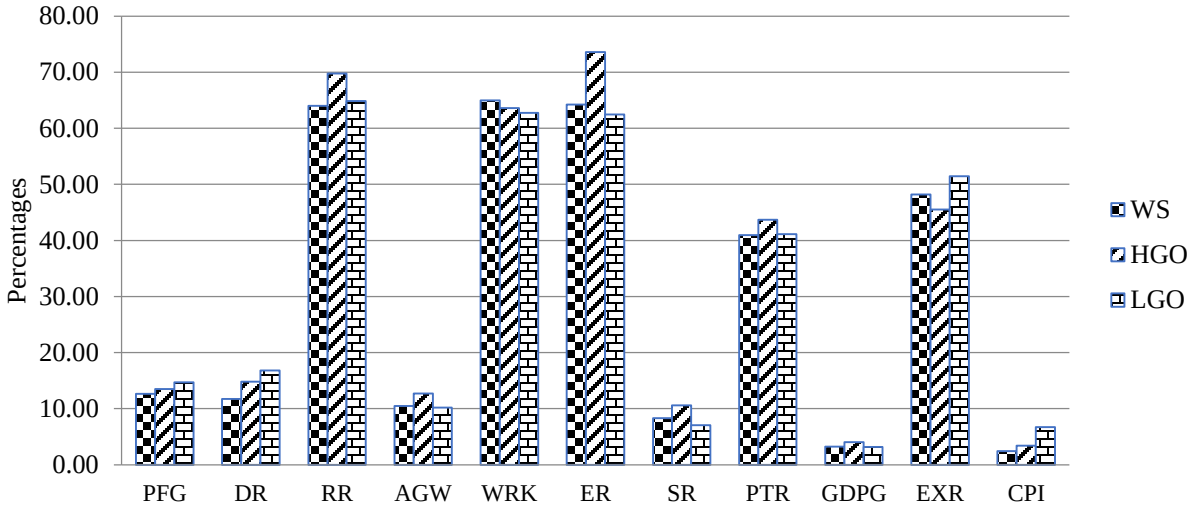


Source: Author's own estimation



Source: Author's own estimation

Figure 03: Comparison of Variables in Selected-OECD Countries



Source: Author's own estimation

Techniques used for Analysis

This study employs dynamic panel data techniques alongside pooled ordinary least squares (OLS), random-effects, and fixed-effects models to comparatively analyze the financial sustainability of pension funds in selected OECD countries. The analysis focuses on contrasting high-growth-oriented countries (those with a pension fund to GDP ratio above the median) with lower-growth-oriented countries (those with a pension fund to GDP ratio below the median) based on observed variables.

The following models present the general economic functions used in this study. Equation (1) models a country's pension fund growth as dependent on various macroeconomic factors. These country-specific factors are further detailed in Equation (2), categorizing them as either pension-related or other indirect influences. Additionally, Equation (3) suggests that the prior year's pension fund growth can affect the current year's growth. Other macroeconomic factors considered include the dependency ratio (DR), replacement rate (RR), average wage (AGW), working age population (WRK), employment rate (ER), savings rate (SR), personal tax rate (PTR), gross domestic product growth (GDPG), exchange rate (EXR), and inflation rate (INF).

$$\boldsymbol{PFG = f(Macro - Economic\ Factors)\_\_\_\_\_Eq.(1)}$$

$$\boldsymbol{PFG = f(Directly\ pensions\ related\ factors + indirect\ factors)\_Eq.(2)}$$

$$\boldsymbol{PFG = (PFG_{t-1}, DR, RR, AGW, WRK, ER, SR, PTR, GDPG, EXR, INF)\_Eq.(3)}$$

Econometric Model

Based on the above-described model, dynamic panel data approach was used, and the following three equations were empirically tested by using pooled-OLS, random effect and fixed effect respectively. The purpose of doing so is to make a comparative analysis of selected-OECD countries based on these techniques and to sort out which model comparatively describes best results.

$$PFGPFG_{(OECD)it} = \beta_0 + \beta_1(PFG)_{(i,t-1)} + \beta_2(DR)_{(it)} + \beta_3(RR)_{(it)} + \beta_4(AGW)_{(it)} + \beta_5(WRK)_{(it)} + \beta_6(ER)_{(it)} + \beta_7(SR)_{(it)} + \beta_8(PTR)_{(it)} + \beta_9(GDPG)_{(it)} + \beta_{10}(EXR)_{(it)} + \beta_{11}(CPI)_{(it)} + \varepsilon_{it} \ (Pooled\ OLS\_Eq: 4)$$

$$PFGPFG_{(OECD)it} = \beta_0 + \beta_1(PFG)_{(i,t-1)} + \beta_2(DR)_{(it)} + \beta_3(RR)_{(it)} + \beta_4(AGW)_{(it)} + \beta_5(WRK)_{(it)} + \beta_6(ER)_{(it)} + \beta_7(SR)_{(it)} + \beta_8(PTR)_{(it)} + \beta_9(GDPG)_{(it)} + \beta_{10}(EXR)_{(it)} + \beta_{11}(CPI)_{(it)} + (\alpha_i + \varepsilon_{it}) \ (Random\ Effect\_Eq: 5)$$

$$PFGPFG_{(OECD)it} = \beta_0 + \alpha_i D_{it} + \beta_1(PFG)_{(i,t-1)} + \beta_2(DR)_{(it)} + \beta_3(RR)_{(it)} + \beta_4(AGW)_{(it)} + \beta_5(WRK)_{(it)} + \beta_6(ER)_{(it)} + \beta_7(SR)_{(it)} + \beta_8(PTR)_{(it)} + \beta_9(GDPG)_{(it)} + \beta_{10}(EXR)_{(it)} + \beta_{11}(CPI)_{(it)} + \varepsilon_{it} \ (Fixed\ Effect\_Eq: 6)$$

Where:

- PFG = Pension Funds Growth
- DR = Dependency Ratio
- RR = Replacement Rate
- AGW = Average Wage
- WRK = Working Age
- ER = Employment Rate
- SR = Savings Rate
- PTR = Personal Tax Rate
- GDPG = Gross Domestic Product Growth
- EXR = Exchange Rate
- CPI = Consumer Price Index
- D_{it} = Dummy for time fixed effect
- ε = the error term

Results Analysis and Discussion

Table-3 depicts the summary statistics of the variables/factors of pension funds growth used in this study. Table 4 presented below of this study that describe the correlations among variables of this study for whole sample, HGO, and LGO countries.

Table-3: Descriptive Statistics

	Full Sample		High Growth		Low Growth	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
PFG	12.67	12.52	13.5	8.19	14.69	9.71
DR	11.73	3.81	14.82	5.21	16.82	5.46
RR	64.01	4.03	69.76	5.02	64.85	6.29
AGW	10.47	2.06	12.68	2.49	14.18	2.79
WRK	64.95	3.43	63.59	4.41	65.75	5.58

ER	64.23	4.31	73.57	5.61	62.47	6.67
SR	8.3	3.93	10.57	5.01	7.04	5.7
PTR	40.93	5.63	43.67	7.38	41.13	8.82
GDPG	3.24	3.11	4.06	2.89	3.15	4.75
EXR	48.21	157.98	45.52	214.7	51.46	266.93
CPI	2.413	2.354	3.387	4.189	6.698	3.461

Source: Author's own estimation

This study investigates the influence of macroeconomic variables on pension fund growth (PFG) in OECD countries, utilizing fixed effects (FE), random effects (RE), and pooled ordinary least squares (OLS) models. Countries are categorized into high-growth (HGO) and low-growth (LGO) groups based on their pension fund performance. The empirical analysis is based on panel data and aims to assess how key macroeconomic indicators—such as dependency ratio, replacement rate, average wage, employment rate, and inflation—affect pension fund expansion across these two groups.

Model Performance and Fit

For the full sample, the R-squared values of FE (19.8%), RE (19.2%), and pooled OLS (18.11%) indicate modest explanatory power. All three models are significant at the 1% level, confirmed by F-test values of 61.05, 58.12, and 54.30, respectively. In the HGO sample, R-squared values improve substantially to 37.35%, 36.28%, and 37.12%, with all models again significant at the 1% level. LGO countries display similar R-squared values (35.03%–35.76%), with slightly stronger F-test outcomes. Based on AIC and BIC model selection criteria, the fixed effect model fits best for the full sample and HGO group, while the random effect model is more suitable for LGO countries.

Pension Fund Growth Dynamics

Lagged PFG is positively and significantly associated with current PFG in the full sample and HGO countries. A 1% increase in last year's PFG leads to a rise of 0.222%–0.235% in the current year. However, in LGO countries, this relationship turns negative, suggesting declining public interest or market immaturity. This highlights structural inefficiencies or weak consumer trust in the pension system in low-growth economies (McDonnell, C. 2024); Roce, Kaminker, & Stewart 2011).

Table-4: Correlation Matrix

Macro-Economic Factors and Their Relationships

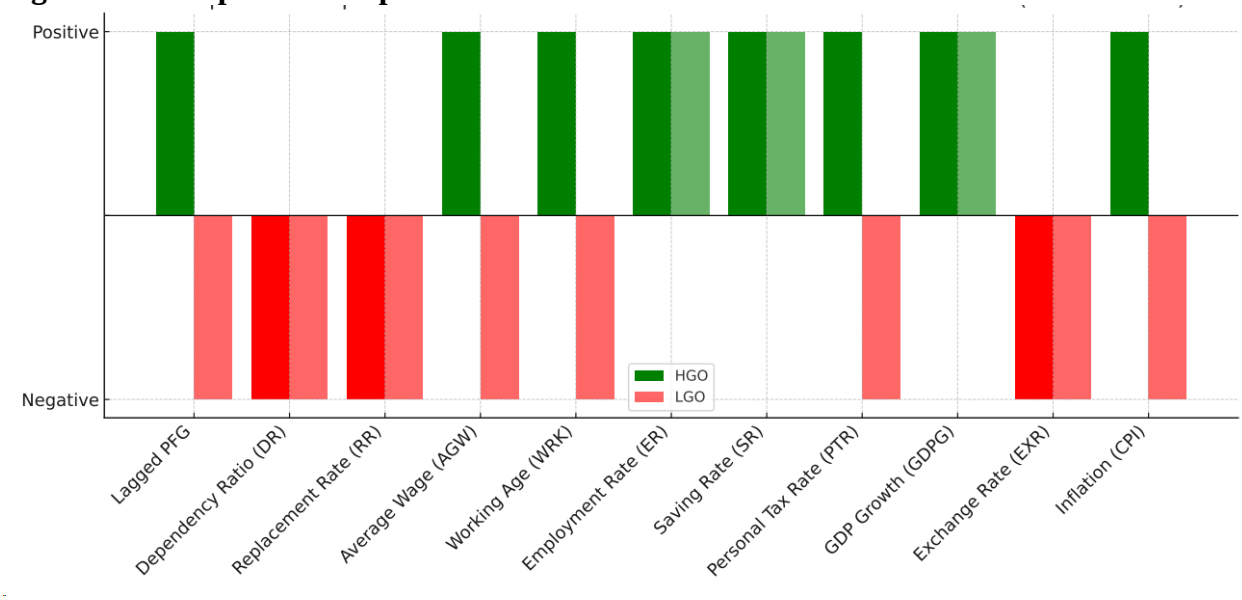
Variables	VIF	PFG	DR	RR	AGW	WRK	ER	SR	PTR	GDPG	EXR	CPI
PFG		1										
DR	8.25	-0.391*	1									
RR	8.37	-0.207*	0.013	1								
AGW	7.22	0.143*	0.780*	0.094	1							
WRK	7.12	0.224*	-0.069*	-0.024	-0.110*	1						
ER	6.11	0.380*	0.029	-0.056	0.051*	-0.245*	1					
SR	3.89	0.201*	-0.016	-0.075	-0.059	-0.047*	-0.052	1				
PTR	2.76	0.451*	-0.037	0.051*	-0.056	0.012	-0.046	0.042	1			
GDPG	1.96	0.271*	-0.114*	-0.562*	0.123*	-0.139*	0.536*	-0.611*	0.467*	1		
EXR	1.44	-0.231*	0.021	-0.033	-0.063	-0.027	-0.061	-0.054	0.051	-0.021	1	
CPI	1.36	0.201*	0.035	-0.051	-0.072	-0.031*	-0.029	-0.055	0.061	-0.026	0.036*	1

* Shows significance at the .05 level

Dependency Ratio (DR)

The dependency ratio negatively and significantly affects PFG across all models and country groups. In the full sample, a 1% rise in DR reduces PFG by 0.125%–0.324%. The effect is stronger in LGO countries, where the same increase leads to declines up to 0.685%. This implies that a higher proportion of non-working dependents puts more financial stress on active contributors, especially in weaker economies which is supported by (Yüksel et. al., 2025 and Magnus, 2012) and support the theory of contribution density.

Figure 04: Comparative Impact of Macroeconomic Variables on Pension Fund Growth



Source: Author's Estimation

The above figure of visual chart compares the effects of key macroeconomic variables on pension fund growth in High-Growth (HGO) and Low-Growth (LGO) OECD countries. Green bars represent positive impacts, while red bars show negative ones. The chart highlights the contrasting behaviors of the same variables across country groups.

Table-5: Macro-Factors Affecting Pension Funds' Growth

	Fixed Effect			Random Effect			Pooled-OLS		
Variables	All Sample	HGO	LGO	All Sample	HGO	LGO	All Sample	HGO	LGO
PFG (L1)	0.222*	0.219***	-0.255***	0.223**	0.227**	-0.145*	0.235**	0.271***	-0.111***
	(0.13)	(0.14)	(0.07)	(0.05)	(0.11)	(0.09)	(0.03)	(0.13)	(0.04)
DR	-0.169**	-0.263***	-0.340***	-0.324**	-0.275**	-0.685*	-0.125**	-0.206**	-0.434***
	(0.15)	(0.05)	(0.07)	(0.06)	(0.14)	(0.1)	(0.37)	(0.01)	(0.02)
RR	-0.465*	-0.359***	-0.348**	-0.135**	-0.215*	-0.138*	-0.128*	-0.175**	-0.127**
	(0.04)	(0.01)	(0.01)	(0.01)	(0.04)	(0.03)	(0.02)	(0.03)	(0.01)
AGW	0.222*	0.196***	-0.268***	0.248**	0.271**	-0.141**	0.134*	0.716***	-0.233***
	(0.13)	(0.05)	(0.07)	(0.05)	(0.1)	(0.09)	(0.03)	(0.03)	(0.04)
WRK	0.831**	0.692***	-0.187**	0.561*	0.123**	-0.226***	0.232***	0.649***	-0.143***
	(0.42)	(0.15)	(0.22)	(0.16)	(0.43)	(0.27)	(0.04)	(0.19)	(0.03)
ER	0.264**	0.324***	0.162***	0.154*	0.241**	0.201***	0.100***	0.344***	0.311***
	(0.11)	(0.02)	(0.02)	(0.02)	(0.13)	(0.03)	(0.07)	(0.02)	(0.37)
SR	0.394***	0.281**	0.112**	0.133**	0.221***	0.150**	0.330**	0.288***	0.177*
	(0.04)	(0.1)	(0.02)	(0.01)	(0.01)	(0.02)	(0.37)	(0.09)	(0.07)
PTR	0.665***	0.206***	-0.685***	0.306*	0.426**	-0.201**	0.101*	0.163**	-0.412**
	(0.03)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.07)	(0.05)	(0.01)
GDPG	0.208**	0.753**	0.592**	0.312*	0.428***	0.396*	0.196**	0.357***	0.228**
	(0.1)	(0.03)	(0.04)	(0.03)	(0.09)	(0.06)	(0.02)	(0.01)	(0.07)
EXR	-0.319**	-0.516***	-0.550***	-0.233*	-0.169**	-0.375**	-0.345**	-0.109**	-0.112***
	(0.08)	(0.03)	(0.03)	(0.03)	(0.07)	(0.05)	(0.22)	(0.05)	(0.22)
CPI	0.213***	0.303**	-0.124**	0.206*	0.322**	-0.201**	0.202**	0.269**	-0.129**
	(0.02)	(0.03)	(0.11)	(0.02)	(0.03)	(0.04)	(0.07)	(0.05)	(0.11)
Cons	5.751***	5.409***	4.964***				2.231***	4.692**	4.263***
	(0.77)	(0.19)	(0.37)					(0.15)	(0.02)
R-squared	0.1985	0.3735	0.3503	0.1920	0.3628	0.3519	0.1811	0.3712	0.3576
F-Model	61.05***	17.97***	20.75***	58.12***	10.23***	23.79***	54.30***	9.89***	21.20***
Hetero	0.0978	0.0765	0.0867	0.0825	0.0567	0.0599	0.0948	0.0777	0.0788
Serial	0.0899	0.0782	0.077	0.0933	0.0685	0.0744	0.0845	0.0732	0.0624
AIC	215.7120	144.9504	147.5712	223.7760	167.5296	143.5392	368.9280	217.7280	165.3120
BIC	212.1168	142.5346	145.1117	220.0464	164.7374	141.1469	362.7792	214.0992	162.5568

Source: Author's own estimation

Working Age (WRK)
The working age population positively correlates with pension growth in the full sample and HGO countries. A 1% increase in working age leads to up to a 0.831% rise in PFG. However, in LGO countries, the relationship is reversed, potentially due to reduced labor force participation or shorter career spans, which affect contributions which is supported by (Ajadi, 2024 and Hinrichs, 2018) and are aligned with the life cycle theory.

Employment Rate (ER)
Employment rate consistently shows a positive impact on PFG across all models and country groups. A 1% rise in employment increases pension fund growth by 0.100%–0.344%, depending on the model. HGO countries benefit more due to stronger job markets, enabling higher and more stable pension contributions which is supported by (Irfan, & Lau, 2024 and Evensen et al. 2015) and are aligned with the theory of pooling.

Savings Rate (SR)
SR has a significant and positive relationship with PFG in all country groups, though stronger in HGO countries. A 1% increase in savings results in a 0.112%–0.394% rise in pension growth. This indicates that households in high-growth countries save more efficiently, supporting pension reserves which is supported by (Garrett, 2024 and Imrohoroğlu, & Zhao, 2018) and are aligned with the theory of pooling.

Personal Tax Rate (PTR)
Tax policy impacts pension growth differently across groups. In HGO countries, higher personal tax rates correlate positively with PFG, possibly due to reinvestments and structured tax incentives for retirement saving. In LGO countries, the relationship is negative, suggesting that higher taxes discourage contributions in economies with limited disposable income which is supported by (Asiedu et. al., 2024 and Parker, 2018) and are aligned with the Welfarists Approach.

GDP Growth (GDPG)
Economic growth, measured by GDPG, has a positive and significant impact on PFG across the board. HGO countries see larger benefits, with a 1% increase in GDPG resulting in up to 0.753% rise in PFG. This underlines the role of economic prosperity in enhancing institutional investment and long-term fund performance which is supported by (Gevorgyan & Hovhannisyan, 2025) and are aligned with the theory of Growth-Led Finance.

Exchange Rate (EXR)
Exchange rate volatility negatively affects pension fund growth in all models and regions. A 1% rise in EXR reduces PFG by up to 0.550% in LGO countries. HGO countries are relatively insulated, likely due to more stable currencies and sophisticated risk management in pension fund investments which is supported by (Liu, Sun, & Xiao, 2024) and are aligned with the theory of Purchasing Power Parity.

Consumer Price Index (CPI)
Inflation, as measured by CPI, shows a positive effect on PFG in HGO countries, possibly because of inflation-indexed pension schemes. However, in LGO countries, CPI is negatively correlated with PFG, indicating inflation erodes savings and pension viability due to lower inflation protection mechanisms which is supported by (Liu, Sun, & Xiao, (2024)) and are aligned with the theory of immunization.

Conclusion

This study examines the relationship between macroeconomic variables and pension fund growth using panel data from OECD countries. The findings show that variables such as the dependency ratio, replacement rate, and exchange rate consistently exert negative impacts on pension fund growth (PFG), particularly in LGO countries. Conversely, savings rate, employment rate, and GDP growth positively contribute to PFG across all models. Clear differences also emerge between country groups: in HGO countries, higher wages, longer working age, structured tax systems, and inflation-indexed pension plans support fund growth, while LGO countries face challenges from weaker labor markets, lower incomes, and inflation-related erosion of savings. The study employs robust methodologies, including fixed and random effects, with AIC and BIC guiding model selection. Diagnostic tests confirm no issues of multicollinearity, heteroskedasticity, or serial correlation.

Research Contributions, Implications, and Policy Recommendations

This research contributes to the literature by distinguishing OECD countries based on pension fund growth patterns and examining heterogeneous effects of macroeconomic variables. It highlights the differing behavior of factors such as average wage, personal tax, and inflation in high vs. low-growth contexts. Importantly, the results also provide practical insights for policymakers. Managing rising dependency ratios requires extending working lives, increasing labor force participation, and targeted immigration policies. Replacement rates, especially in HGO countries, should be gradually reformed to align benefits with lifetime contributions and economic capacity. Policies that promote decent job creation and higher wages are essential to strengthen contributions, particularly in LGO countries. Expanding savings through tax incentives, financial literacy programs, and matching contributions can further reinforce pension sustainability. Additionally, stable fiscal and macroeconomic conditions—strong GDP growth, controlled inflation, and reduced exchange rate volatility—are critical for resilience. Overall, HGO countries should focus on maintaining growth momentum and optimizing tax and replacement systems, while LGO countries require structural reforms to boost employment, savings, and coverage.

Limitations and Future Directions

While this study classifies countries based on pension fund growth, future research could employ alternative classifications such as income inequality or demographic dependency. Furthermore, the directionality of causation remains an open question; future work should examine potential bi-directional relationships between pension fund growth and macroeconomic variables, particularly GDP and savings rate.

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