

## The Pension Fund Investments Role in Financing and Enabling Global Development in Indian Market

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### Abstract

The Pension fund show a dynamic role as financial mediators in Indian financial market where pension fund that is divided into bonds, Stocks and Commercial real estate, including traditional intermediation fund theories. In terms of direct holdings for pension investments, the pension fund also assists in carrying out the functions and financial system. The Indian Government commenced the National Pension System under the Act of Pension Fund Regulatory and Development Authority (PFRDA) so that country's peoples can be covered under social security arrangement that is reasonably priced. The research enlightened the annuity investments imprint over overall Indian financial market growth. The Purposive sampling is the basis of the study, which also examines pension plans using secondary sources of information. The granger causality test applied to analyze the significant impact over market with pension investment. The study also found that under the pension program, a retiree in India may invest his contribution up to a certain amount. In conclusion, the researcher concludes that the capital market has an significant impact of investment as pension investment and capital market development defiantly boost up and improve country's economic development at a large scale and also useful in enhancing the return on pension investment. This phenomenon support the investment amount specifically pension fund can be used as evidence to growth the capital market in the country.

**Keywords:** Capital market, Assets Allocation, Pension Fund, Pension Fund Investment, codes: E22, G18, G23

### 1.1 Introduction:

Reforms to social security are essential for tackling important policy problems in both developed and developing nations. Pension funds, which frequently make large long-term capital investments for the expansion of organizations and projects, gain importance in the eyes of investors, policymakers, and market analysts. Pension funds, which are regarded as institutional investors, pool and invest money contributed by both employers and employees for the benefit of future beneficiaries. These investments help people save for retirement, and both OECD and non-OECD nations have seen significant increases in their pension funds in recent years. Due to their long-term liabilities, pension funds do not allow for early withdrawals. Instead, investments in high-risk, high-return securities such as debt, real estate, government bonds, and deposits are prioritized.

As of 2013, pension fund assets in the United States accounted for nearly 83 percent of the GDP, with 84.2 percent being from pension funds on a weighted average basis for all OECD countries. In India, despite being an emerging economy with growing pension fund investments, social security awareness, especially concerning old age, remains limited. The total investment by determined funds reached Rs 12 lakh crores in 2012, constituting almost 11 percent of the GDP in the subsequent year. To solve social security issues, many developing nations have enacted a variety of laws and regulations, with pension funds providing monetary markets with steady investment capital. Pension funds, as institutional investors, support innovation, increase corporate governance, and enhance the efficiency of the financial system. A defined contribution pension plan was launched in India in January 2004, and it was overseen by the Pension Fund Regulatory and Development Authority, which was founded in 2013.

Despite these developments, India's social security system faces challenges such as poor coverage, fiscal instability, and a lack of formal social security in the unorganized sector. Pension funds play a crucial role in the equity

market and overall economic development. The regulatory environment influences investment attitudes, impacting equity and bond markets and, consequently, the broader economy. While the government's role in financial investment performance is significant, pension funds often prioritize safety, holding a nominal proportion of equity in their portfolios. Regulatory restrictions on equity proportions present a significant opportunity for system development.

## **1.2 Literature Reviews:**

Grace et al. (2010) emphasized the significance of retirement planning for both men and women, exploring investor behavior theories. Employing an exploratory research design, they utilized interviews to discern differences in retirement planning across various psychometric variables. Robb (2010) delved into employees' behavior regarding retirement assets annuitization, analyzing attitudes toward immediate annuities through questionnaires from participants in defined contribution plans. The study uncovered varying attitudes between genders and identified an indirect relationship between annuity attitudes and risk aversion using Pearson correlation coefficients. Imam (2011) investigated the government's role in pension fund management, highlighting the impact of central and state governments on investment performance. Rono et al. (2010) examined pension fund investments under Retirement Benefit Act Guidelines, employing questionnaires to survey 175 fund trustees and 13 managers. Statistical analysis using SPSS indicated profitable investment amounts, albeit potentially below annual inflation. Hryckiewicz (2009) explored the link between official assets progress, investment habits, and stock exchanges in emerging European countries, using GMM techniques on historical data from eight countries. Davis and Hu (2008) compared 19 evolving countries, suggesting that superannuation funds' scope could indicate changes in commercial and financial progress. Turner and Hughes (2008) investigated the decline of Defined Benefit plans in various countries, observing a shift in pension expenditures to employees. White (2003) outlined reasons for employers terminating DB plans, such as rising costs and diminishing returns. Zhng et al. (2007) studied inflation-linked bonds and their role in defending against market inflation, emphasizing the potential loss of real value in pension benefits over extended periods. Milos Laura Raisa (2012) reviewed the impact of superannuation funds on the capital market in the European Union, noting the minimal effects of the financial crisis on pension reforms. Enachea et al. (2015) established a positive relation between capital market development and pension reform, indicating a long-term effect on market capitalization. Davis and Hu (2004) explored funding improvements in pension plans over pay-as-you-go links, finding a positive relation between pension assets and economic processes across 38 countries. Bayar (2016) investigated the effects of different pension plans on debt and stock exchanges in Turkey, concluding that private pension plans positively influenced both markets, suggesting causality among them.

## **1.3 Research Methodology:**

### **1.3.1 Research Gap**

According to the review of literature, a great work of research has been done to examine the pension plans of different nations, including China, Poland, Hungary, Sri Lanka and others on individual basis. However, no research has been done on the impact of India's pension fund on the country's capital market. The literature review also included studies that analyzed the pension plans of China and other nations. The retirement fund or pension fund will aid in the nation's overall economic development if it has a progressive impact on the financial capital market. An attempt was made to compare the impact of pension funds on the capital market in this study.

### **1.3.2 Objectives**

- To assess the impact of pension fund investments on the development and expansion of the Indian capital market.

### **1.3.3 Sources of data collection**

The study utilised secondary sources pertaining to pension schemes in India. Specifically, data was extracted from reports published by the Pension Fund Regulatory and Development Authority (PFRDA), the Reserve Bank of India (RBI), and central government of India documents. The national pension plan, market capitalization, stock value traded, and return on investments on treasury bonds, stocks, enterprise bonds, and bank deposits from 2004 to 2019 are among the historical data that India has available.

#### 1.4 Data Analysis and Interpretation

The national statistics for retirement funds, in particular pension investments, and the Indian capital market from 2004 to 2019 were covered in this section, along with a history of new pension scheme investments in India. The national stock exchange market data is used to quantify the size of the Indian stock market and capitalize it. The total amount of government, corporate, and financial bonds issued is included in the capitalization of the bond market. The PINVEST ratio, which measures the amount of pension assets under management relative to GDP, is commonly used to estimate the size of pension assets. The metrics used to halt the expansion of the financial capital market are MCG and STG. The market capitalization ratio over GDP is known as the MCG.

**Table :1 Pension Fund And Capital Market Data In India**

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>PAU M Rs.</b>	-	-	-	-	-	400000	800000	190000	310000	480000	650000	728666	853523	978381	11032381	12215873
<b>GDP %</b>	30.7	32.75	33.58	35.81	34.71	33.95	33.23	34.31	33.43	31.29	30.08	32.32	32.19	32.06	31.94	31.81
<b>M.C %</b>	1481.47	1911.17	2467.49	3480.65	2471.35	3041.28	2355.99	2018.45	2070.64	2062.34	2105.21	2287.44	2282.83	2278.22	2273.61	2269.01
<b>STG %</b>	56.54	69.31	93.97	77.19	81.27	64.51	35.4	33.7	28.96	35.83	27.26	21.73	16.2	10.67	5.14	-0.38
<b>MCG %</b>	48.249	58.34	73.47	97.18	71.18	89.57	70.89	58.82	61.92	65.89	69.98	71.08	71.33	71.57	71.82	72.07
<b>PINV EST %</b>	26.2	27.57	26.25	45.09	30.4	47.13	66.54	59.87	71.49	57.52	57.36	72.88	77.22	81.56	85.9	90.24

**Source: (PFRDA REPORT 2009-2019)**

If With risk management being the primary focus of pension investments, covariances between various investment vehicles are revealed by analyzing data on stocks' return on investment (ROI), enterprise bonds, bank deposits, and Treasury bonds from 2004 to 2014. The national stock market annual reports and bond market statistical analysis annual reports are the sources of the historical data for the national stock exchange market and the typical return on treasury bonds compared to enterprise bonds. The performance of Treasury bonds is indicated by the average return over a ten-year period. The return on savings (ROI) for bank savings is calculated as the average interest rate on reserve bank of India deposits for a year. This data is taken from the Central Bank of India website.

**Table :2 Different Investment Tools' Average ROI % INR**

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Bank saving</b>	3.4	3.5	3.5	3.5	3.5	3.5	3.5	4	4.7	3.78	4	4.17	4.24	4.32	4.39
<b>Treasury bond (10 years)</b>	6.67	7.55	8.02	7.93	7.01	7.04	8.02	8.35	8.31	8.26	8.28	8.5	8.6	8.7	8.8
<b>Stock</b>	30.61	52.25	58.42	42.71	60.09	49.58	55.26	52.25	54.72	62.1	76.28	68.8	71.26	73.72	76.19
<b>Enterprise bond</b>	3.2	4.6	0.72	2.24	0.89	4.31	1.26	0.93	0.79	0.53	1.02	0.26	0	-0.26	-0.52

**Source: PFRDA reports**

The above table return on investment on average basis for bank deposits, Treasury bond, stocks and enterprise bond in India from 2004 to 2019 have been summarized in the mentioned tables.

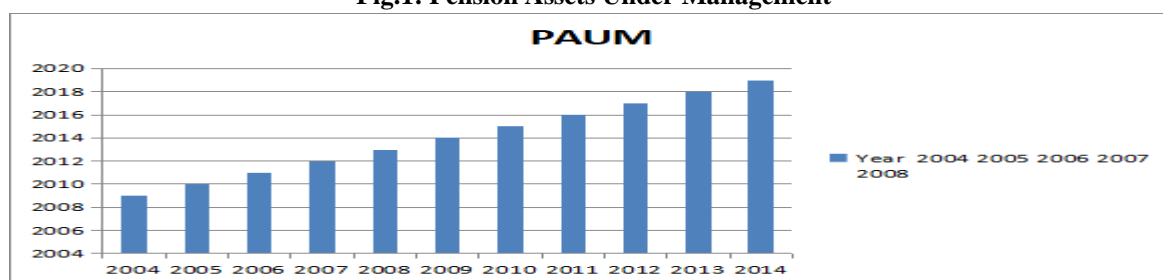
**Table :3 Covariance of Fundamental Investment Variables for Pension Funds**

Variables	Bank saving	Treasury bond	Stock	Enterprise bond
Bank Saving	0.16	0.10	0.42	0.26
Treasury Bond	0.10	0.21	1.84	-0.58
Stock	0.42	1.84	78.76	-5.01
Enterprise Bond	-0.26	-0.58	-5.01	1.65

Source: (Analysis from PFRDA report)

The four majorly simple investment methods (including Treasury bond, Bank deposits, Enterprise bond Stocks) describes the co-variance using Ms-Excel. The best way to allocate assets will be determined using the covariance results.

**Fig.1: Pension Assets Under Management**



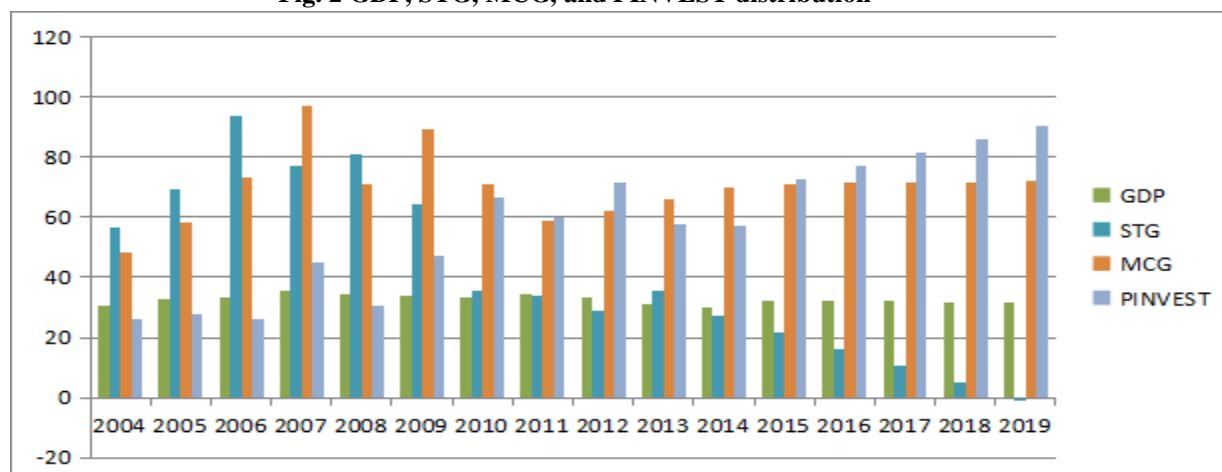
(Source: regarding the annual difference in PAUM (PFRDA Reports))

#### Distribution of Return on Investment for Treasury Bond for 10 Years

The graph below summarizes Treasury bond statistics from 2004 to 2019 based on average rate of return. The ROI on Treasury bonds is examined to see if it tails to the normal distribution (with a confidence level of less than five percent) using the E-views software. If the P value is less than 0.05, the hypothesis may be disproved.

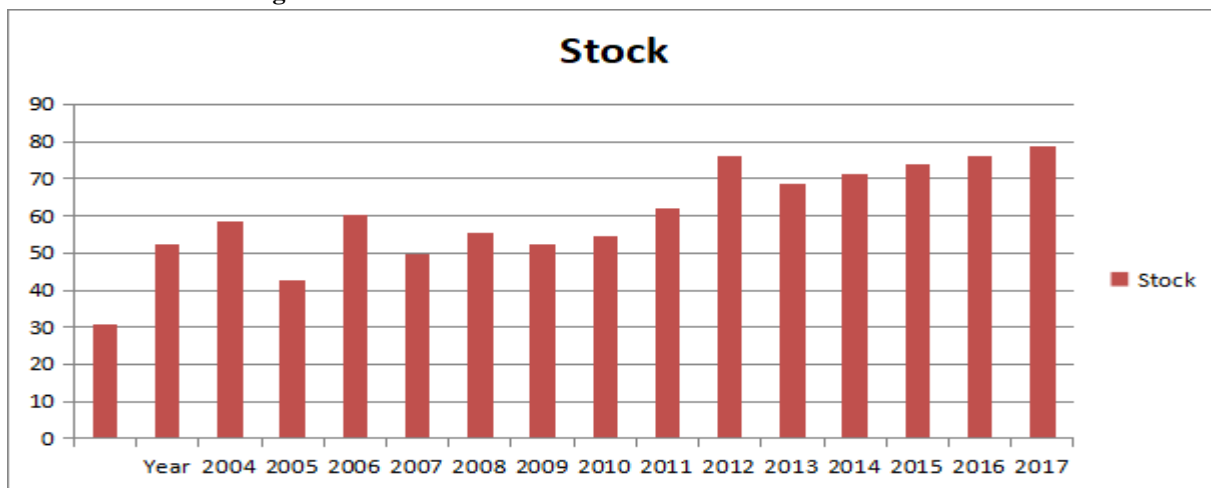
The results for the Treasury bond indicate that the JB factor is 1.40 and the probability is 0.49, both of which are higher than 0.05. The Treasury bond ROI therefore exhibits a normal distribution and the null hypothesis is rejected.

**Fig. 2 GDP, STG, MCG, and PINVEST distribution**



Source:(Analyzed from PFRDA)

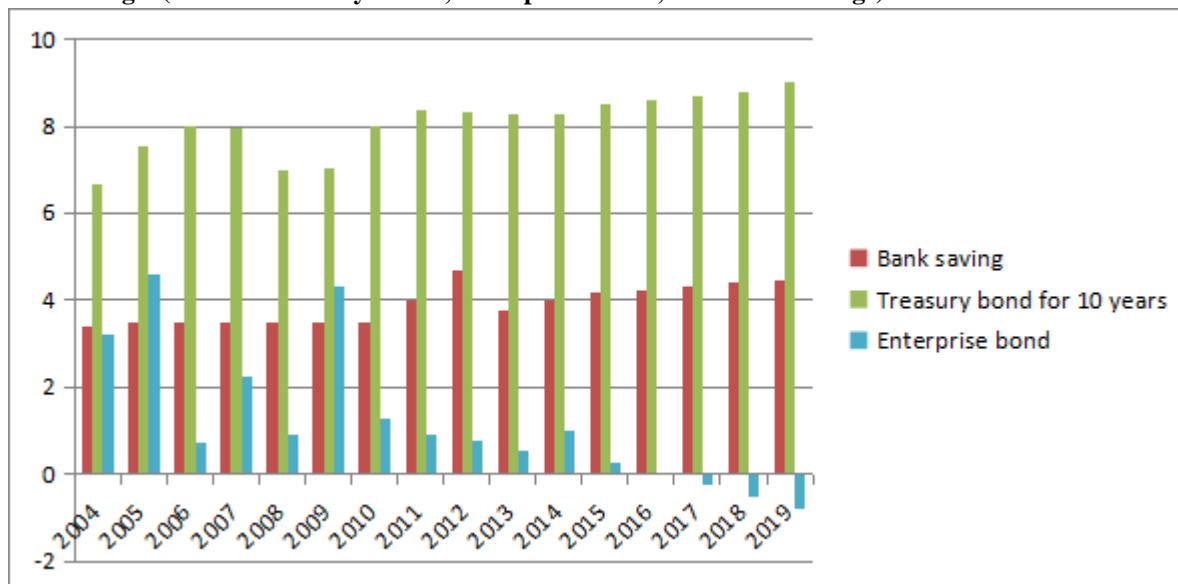
**Fig.3 Distribution of Stock ROI**



(Source: ROI of Stock)

The graph represents the ROI distribution for 22 stocks on average rate of return from 2004 to 2019, The E-views software used to examination whether the ROI on stocks tails to the normal distribution (under 5 percent confidence level). From 2004 to 2019, the stock ROI on the national stock exchange market is intended at the start and end of each year. In hypothesis testing, the P value is less than 0.05. According to the stock's results, the probability is equal to 0.87 and the JB factor is 0.25. After accepting the null hypothesis, stock ROI occurs typical distribution.

**Fig.3 (ROI on Treasury Bonds, Enterprise Bonds, and Bank Savings)**



(Source: Analyzed from PFRDA reports)

The graph represents enterprise bond's ROI distribution. Based on average rate of return data, enterprise bonds were outlined from 2004 to 2014. The E-views software used to examination whether Under a 5% confidence level, the ROI on enterprise bonds tails to the normal distribution. eleven observations in all about the enterprise bond's average return. If P is less than 0.05, the hypothesis can be disproved. According to the enterprise bond test results, the probability is 0.39, greater than 0.05, and the JB factor is 1.84. Given that the enterprise bond ROI \_follows N (4.88, 8.79), the null hypothesis is thus accepted.

### ADF Test

ADF test is used to evaluate the stability of the MCG, STG, and PINVEST variables. “The original series is unstable and has unit root,”. Once test unit root in level, (PINVEST, MCG & STG) have a unit root. Again the ADF test in 1<sup>st</sup> found difference. All results are stable at this time (below the confidence level-@ 5 percent and @ 10 percent). The ADF test results summarized via E-views software in level and the first variation for the variables together with MCG and STG, PINVEST, STG and MCG with almost a total of 20 observations. The ratio of total stock value traded over GDP is known as STG while the total market capitalization over GDP is known as MCG and these two important variables are used to quantify capital market expansion. PINVEST is the primary indicator that is used to calculate the amount of pension assets under management as a percentage of GDP.  $GDP / (\text{Pension assets under management})$  equals PINVEST. T statistics (the critical value as under the 1 percent, 5 percent, and 10 percent confidence levels) are used to compare the variables. While nearly all of them are steady under the first differences, the test results indicated that MCG, STG, and PINVEST are unstable in level.

**Table-4 ADF Test Results**

<b>Pinvest has a unit root</b>	<b>ADF test result</b>	<b>ADF test result(d)</b>	<b>MCG has a unit root</b>	<b>ADF Test result</b>	<b>ADF Test result(d)</b>	<b>STG has a unit root</b>	<b>ADF test result</b>	<b>ADF test result(d)</b>
<b>t statistics (Ratio)</b>	-1.44	-4.35***	t statistics	-2.55	-3.68***	t statistics	-0.82	-2.54**
<b>Probability (%)</b>	0.51	0.01	Probability	0.13	0.02	Probability	0.76	0.13

Note: \*\*\*, \*\*, and \* represent significance level at 1 percent, 5 percent and 10 percent respectively.

### Cointegration Test

**Table :5 Cointegration Test Results**

<b>Series</b>	<b>MCG AND PINVEST</b>	<b>STG AND PINVEST</b>
<b>Eigen value</b>	0.68	0.89
<b>Trace statistics</b>	12.87	22.21
<b>0.05 Critical value</b>	15.49	15.49
<b>0.01 Critical value</b>	13.42	13.42
<b>Probability</b>	0.11	0

(Source: Analyse from Reports)

The ADF results shows that PINVEST, STG and MCG are not stable, but then again differ in the 1st and variance of them is stable. The Cointegration test is used for finding any relationship that whether a stable linear relationship between the non-stationary series exists or not. (With confidence level @5 percent) The PINVEST and STG, PINVEST and MCG have no cointegration relationship. (With confidence level @10 percent) T statistic 12.87 and 22.21 are greater than crucial value i.e. 13.42. With these parameter and situation, PINVEST and MCG indicates no cointegration @ 0.05 level; whereas PINVEST and STG have a cointegration relationship.

The table presents the results of the unrestricted cointegration test for MCG and PINVEST, as well as for STG and PINVEST. It includes a total of nine observations. The two variables that are most commonly used to quantify the overall development of the capital market are MCG and STG. Similarly, the PINVEST serves as the indicator that is specifically used to calculate the percentage of GDP that is made up of pension assets under management. In order to compare the trace statistics with the critical levels of five and ten percent, calculate PINVEST as pension assets under management divided by GDP. The analysis revealed that, at the @10 percent confidence level, there is a cointegration relation between PINVEST and STG and PINVEST and MCG.

**Table - 6 Granger Causality Test**

Null Hypothesis	F-STATISTICS	PROBABILITY
Mcg doesn't granger cause pinvest	1.30	0.55
Pinvest does not granger cause MCG	10259.3	0.00
STG does not granger cause PINVEST	22.47	0.15
PINVEST does not granger cause STG	59.55	0.09
STG does not granger cause MCG	14.50	0.19
MCG does not granger cause STG	0.48	0.75

(Source: Analysis of Granger Casuality test)

The Granger Causality test (with a confidence level of 10%) is used to analyze the interactive relationship between PINVEST and MCG, PINVEST and STG. There are a total of eight observations. PINVEST is the primary indicator that is used to calculate the size of pension assets under management as a percentage of GDP. The ratio of STG is the total stock value traded over GDP, while the ratio of MCG is the total market capitalization over GDP. GDP / (Pension assets under management) equals PINVEST. The third row lists the P values for various null hypotheses, while the F inferences under the second row's different null hypothesis are described.

## 1.5 CONCLUSION

The analysis's conclusions demonstrate that pension funds are institutional investors, which can strengthen the capital market's superiority and limpidity. The growth of the capital market may be a significant factor in attempting to improve pension fund performance. According to the study, the elementary pension fund has a positive influence on the growth of the capital market, which is important evidence in favor of pension investments. The study's finding concludes that government should consider differentiating investments, enhancing transparency in subsequent steps, and strengthening macro-control on the capital market.

### 1.5.1 Limitation:

The study only looked at the relationship between pension funds and the capital market from 2004 to 2019 because new pension schemes and additional pension reforms were implemented after 2004. Examining the effects of pension investments and the capital market, in particular stock bonds and market capitalization, was the main goal of the study. The study was limited to pension plans in India, but it could be expanded in a variety of ways, such as through comparative analysis, and it could give a clearer picture of the influences of the stock market on pension fund investments in the capital markets.

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