Delta Gains of Investment in Stocks on Financial Performance of Self-managed Provident Funds in India

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Abstract

Self-managed Provident Funds (PFs) have been in existence for decades now. However, frequent changes in regulatory guidelines on investment patterns and reporting standards to be adhered to by law have led the funds to be managed with benign neglect. Even though regulatory guidelines allow them to invest 15% of their corpus in stocks, most of them have refrained from doing so. Our empirical research found that if they had invested in stocks, they would have outperformed the mandatory EPFO returns. Using a hypothetical portfolio, we found that with 15% exposure to stocks, the self-managed provident fund corpus would have grown 5.18% more than the mandatory EPFO returns, and with 20% exposure to stocks, the corpus would have grown by 10.35% more than the mandatory EPFO returns between FY 2005 and FY 2014, notwithstanding two severe corrections in the stock market.

JEL CODES: C12, C33, C51, N25, G23

Keywords: Provident Funds, Investment Pattern, Asset Allocation, Portfolio Mix, Stocks Participation, Equity, Debt, Trustee, Self-Managed Funds, Privately Managed Funds, Employee Provident Fund Organization (EPFO)

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Introduction

Retirement funds are the funds which are accumulated throughout the working life of an individual for a proposed benefit payout when he superannuates or actually retires. This fund is an important source of monetary wealth used to earn income (in the form of annuity) to maintain the standard of living of the beneficiaries after retirement.

In the absence of a universal social security system, management of pension funds is important to Indian citizens. Occupational employee benefit funds namely, provident fund, gratuity and superannuation fund, form a large part of the social security structure for the organized sector employees. Occupational pension funds are regulated by the government through various agencies. Each type of retirement benefit fund could be managed by the employer (self-managed fund) or can be outsourced to government agencies (provident fund) and insurance companies (gratuity / superannuation). Gratuity and superannuation funds are also allowed to be managed by insurance companies under the aegis of the Insurance Regulator – IRDAI (Insurance Regulatory and Development Authority of India). Gratuity and provident funds are defined benefit funds whose liability has to be borne by the employers. Superannuation (pension) can be DB (Defined Benefit) or DC (Defined Contribution) based on the employer's preference.

The various types of retirement benefit funds available in India are very diverse; these include EPFO schemes, civil services schemes, public sector schemes, occupational pension schemes, voluntary tax advantage schemes, and schemes for the unorganized sector as presented in Figure-1.

Retirement Schemes in India

EPFO
EPF - Defined Contribution
EPS'95 - Defined Benefit
EDLI

Occupational Pension Funds
Superannuation - Defined Benefit
Superannuation - Defined Contribution
Gratuity - Defined Benefit

Civil Services Schemes (for employees of Central, State Government and Local Bodies)
NCPS (New Central Pension Scheme) - Defined Benefit
GPF (General Provident Fund) - Defined Contribution
Group Superannuation
NPS

Voluntary Schemes
Small Saving Schemes
Retirement/Pension offerings from Insurance Companies
PPF (Public Provident Fund) - Defined Contribution
NPS (National Pension System)

Public Sector Enterprises and Sector/ Special Category specific Schemes
Usually Defined Benefit Schemes
Coal mines Provident Fund
Seamen's Provident Fund
Assam Tea Provident Fund etc.

Schemes for Unorganized/BPL Sectors
National Assistance Schemes / NPS
Varishtha Bima Yojana
Atal Pension Scheme
Self-help group/Micro finance bodies
Group Insurance schemes

Figure-1: Various Types of Retirement Schemes in India

Management of Provident Funds in India is highly regulated. These funds are defined contribution by nature (EPFO, 2015a); there exists pre-assigned contribution percentages (of basic + DA) against each employee, both by the employee (12% towards EPF) and by the employer (3.67% towards EPF, 8.33% towards EPS, 0.5% towards EDLI + admin charges). However, the options available with the employer for handling these funds are limited; either they can park these funds with EPFO wherein the contributions are made by the employer as per defined allocations from the employee and employer, or they can manage it in-house. If the fund is managed in-house, it is known as a self-managed provident fund (EPFO, 2015b). Given the complex nature of constitution of these funds, the management of the funds becomes equally tedious because of the guidelines for investments to be followed and matching up with the EPFO yearly returns for self-managed provident funds. This paper tries to evaluate the performance of self-managed provident funds in India and unravel a few unsolved mysteries with respect to aspects of the investment portfolio mix.

Motivation of the study

As per EPFO (2009), in the self-managed provident funds' universe in India, there are 2,589 entities, which is approximately 1% of total employers and 18.8% of total organized workforce. In other self-managed pension funds such as gratuity and superannuation funds, there are approximately 1,200 entities.

The retirement fund industry in India is in a nascent state and is not as diverse as its counterparts in developed countries. It is an opaque system and fiduciary responsibilities are delegated, but not owned. The investment pattern is regulated and reporting is done annually; however, the money managers can use the funds according to their experience and market conditions within the investment guidelines. Fund management is both active and inactive; however, the significance of this activity varies, which could be attributed mainly to the existence of systems with loaded regulatory regime and limited scope of operations with yearly reporting practices.

Retirement funds are institutional funds and because of their sheer size, if properly employed, could change market dynamics as observed in the developed markets. The ownership of the funds is with the Trust and the benefits provided to the members could be Defined Benefit - payout is defined, or it could be Defined Contribution – where the contribution amount is defined. In case of a default or shortfall in the earnings, the company which is the plan sponsor, fills in; like in the case of provident funds, self-managed funds need to match the EPFO rate for the year. However, with respect to operational aspects, in most cases, voluntary disclosures rather than mandatory ones are reported only once a year as disclosures to the IT department for tax exemption and audit purposes. Traditionally, management of retirement funds has been a back-burner activity for the corporate sector; it has been seen as a statutory tick-box job more than needing professional expertise (Bhattacharya, 2016). However, with the new investment rules providing more flexibility in the investment guidelines, some traction from the corporate sector has been observed through management purview and learning from the organized markets.

Multiple regulatory changes in the investment guidelines have also provided opportunities to improve upon the investment systems of self-managed provident funds. However, it remains to be seen whether relaxing the investment limits would help in bringing the needed change. Asset sub-classes are more varied now, more options for investments are available, and also allowance of investment into equities provides more avenues of investments and opportunities for improvement in overall returns. The investments are measured against a broad benchmark and possibly provide an opportunity to achieve excess returns. Some of the earlier studies by Markandan (2001); Sabharwal, Madhu, and Gopal (2002) in the Indian context have been descriptive. However, the current study critically analyzes the allocation of funds and suggests ways of improving investment outcomes.

Privately managed provident funds have to follow a stringent investment pattern as per Rule 67 of the IT Act 1961. The investment rules, also known as investment pattern, have changed in the last two and a half decades. Table-1 captures the changes between 1990 and 2005. The rules are guided by the guidelines from the MoF (Ministry of Finance), prescribing minimum limits on categories of investments. There are provisions for discretionary tactical allocations under a few categories. The category called the special deposit scheme, which had a significant proportion of privately managed funds invested in it, has been merged with the other government securities category. Equity as an investment asset class was added in the investment pattern in the year 2005.

Investment Categories/Year	1990	1991	1992	1993	1994	1995	1996	1997	2003	2005
Special Deposit Scheme	85%	85%	85%	70%	55%	30%	20%			
Government of India Securities						25%	25%	25%	25%	25%
State Government Securities	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
Gilt Mutual Funds								As a substitute to SDS/ GOI/ State Securities		
PSU/PFI Debt/ CBLO				15%	30%	30%	30%	40%	30%	30%
Equity										5% max
Discretionary Allocation								20%	30%	30%
Private Sector Debt								At Trustees discretion		
Equity Mutual Funds										At Trustees discretion

Table-1: Investment Pattern under IT Rule 67 Funds (1990-2005)

In 2009, the investment pattern was changed and guidelines stipulating specified maximum percentages for each investment category were laid out (Table-2). A few new investment instruments like rupee bonds from international bodies like International Bank for Reconstruction and Development, Asian Development Bank and International Finance Corporation were added in the permitted investible instruments along with money market instruments. Notable additions in the investible instruments were fixed deposits/ term deposits and stocks; norms for credit rating requirements and the definition of turnover ratio for certain categories of assets were added. For investments in debt securities, it has been stipulated that a*t least 75% of investments in this category must have an investment grade rating from at least one credit rating agency (GOI, 2008).*

Investment	Maximum investment
Government securities Government guaranteed bonds Gilt MFs	55%
Debt securities (≥3 year maturity) Term deposit (≥1 year) of scheduled commercial banks subject to some conditions Rupee bonds of IBRD, IFC, and ADB	40%
Money market instruments	5%
Listed shares with derivatives on NSE or BSE Equity linked schemes of MFs	15%

Table-2: Investment Pattern (2009)

This pattern was suggested and accepted by the Ministry of Finance but the Ministry of Labour and CBT EPFO did not accept it for a long time. Hence, self-managed provident funds did not follow this investment pattern; particularly the equity investment opportunity was not availed. A new set of rules for investment pattern has come into effect from April 1, 2015 (The Gazette of India, 2015).

Despite restrictive investment norms and EPFO guidelines, returns on Provident Funds managed by privately managed trusts in India, have to be matched to that declared by EPFO every fiscal year. With the restrictive regulatory environment and fluctuating interest rates in the Indian economy between 1990 and 2014, matching EPFO declared returns by privately managed funds had become extremely difficult.

Many employers faced losses owing to the restricted investment guidelines. Losses were incurred due to very limited options of churning. The main reason for this poor performance was investment becoming illiquid, the volatile interest rate environment and other challenging market conditions. With limited investment avenues, the lack of focus on managing retirement funds as a core business activity of an organization, led to benign neglect of managing the funds accumulated in self-managed provident funds.

Even though the pension fund industry is an important sector of the economy, there hasn't been any academic scrutiny of this sector. One of the reasons could be that financial performance data is in the private domain; hence, this research has been done with primary collection of data on size, allocation, governance and performance of funds between FY2005 and FY2015. The motivation of this paper is to determine if self-managed provident funds in India are well organized to carry out their fiduciary responsibilities of effectively managing the provident funds in-house and earning appropriate returns in the long run.

Literature Review

According to Brinson, Hood, and Beebower (1986), among the 3 factors - asset allocation, stock selection and market timing – the most important factor that affects the consistency in investment outcome is asset allocation, which contributes 94%, followed by stock selection at 4% and market timing at 2%. The findings reveal the significance of asset allocation over a long period of time, asserting the views on disciplined investments.

The most important element in the investment decision process is the portfolio asset-mix decision. Asset allocation among instruments: (i) intermediate and long term fixed-income instruments, (ii) stocks, predominantly common stocks, and (iii) cash or cash equivalents (maturity of less than a year), is the most challenging investment decision that the trustees must make and continually re-evaluate as the economic and financial outlook change. This involves a judgment about the relative investment merits of stocks and fixed income securities over the near term under different economic scenarios (McGill, Brown, Haley, and Schieber, 1996). Managing the policy mix through asset allocation decision cannot be avoided. If we choose not to make an asset allocation decision, the markets would do it for us (Arnott, 1997).

The choice of asset classes has always remained a bone of contention among the researchers and everybody has an opinion. Nofsinger (1998) used abnormal returns as a parameter in his analysis but did not find a statistically significant positive effect in relation to investments in stocks, while Bauer, Cremers and Frehen (2010) found that investment in stocks tends to generate positive abnormal returns. Albrecht and Hingorani (2004), on the other hand, found evidence of a negative impact of investments in stocks on risk-adjusted financial performance. Investments in stocks form an essential part of the asset mix as suggested by Markandan (2001) and impact the financial outcomes significantly. Susan (2000) has theoretically tried to measure the performance of investment strategies on multi-decade horizons with reference to stocks. Her research found that the returns on stocks as an asset class outperforms debt and the probability of stocks as an asset class giving lower return than debt, is fairly low over a long investment period. Notable studies on the popularity of the Chilean Pension Scheme by James (1993); Mesa Lago (1989, 1991) highlight the importance of type of asset classes they are invested in, because of high returns earned by them compared with other Latin American countries and other diversified portfolios.

Historically, investments in stocks have produced higher returns than returns from fixed-income securities; earlier studies have also indicated that investments in stocks have a positive effect on investment returns (Useem & Mitchell, 2000; Coronado et al., 2003; Hess, 2005). Pension funds in the OECD countries in 2014 invested, on an average, 23.8% of their portfolio in stocks, 51.3% in money market instruments and bonds, and 9.6% in cash and deposits. In non-OECD countries, the investments were 27.3% of the total portfolio in stocks, 51.9% in money market instruments and bonds, and 10.3% in cash and deposits (OECD, 2015).

While asset allocation is often thought of as one decision, in reality, it consists of several distinct and largely independent decisions (Arnott, 1997). The policy on asset allocation is a long term decision aimed at meeting fiduciary responsibility of the fund in the short- and long-term. This mix represents careful balancing between the conflicting desires for return and for controlled risk. Hence, an ad-hoc approach cannot substitute a meticulous asset allocation process.

Brinson et al., (1991), analyzed the 10-year results of 82 of the largest US pension funds to see the impact of ad hoc changes in asset mix on the portfolio investment outcome and check if value could be added by ad-hoc changes in the asset mix. Their study shows that most ad hoc approaches do not add value. The results demonstrate how the typical pension funds forfeited 26 basis points per annum through sloppy ad hoc shifts in the asset mix. This is a huge difference; after 10 years, a one billion dollar portfolio growing at 10% per annum would be worth 62 million more without these ad-hoc shifts.

No element in the investment decision process has a bigger impact on the long-term results than the policy on asset mix decision. Asset allocation is vital because it helps in reducing the pension costs and controls the funding ratios, thus helping the plan sponsor's/corporate's profitability. One often neglected reality is that money made in the pension fund is worth at least the equivalent amount of money of operating earnings. However, in the current tax environment, it may be worth more because of the provisions on pensions. Asset mix decision in asset allocation is not a single decision. It is vital because asset mix drives the capitalization of current market opportunities and the strategies for the long term. Tactical asset allocation represents an opportunistic strategy that seeks to enhance returns through deliberate shifts away from this normal policy allocation. The asset mix is aligned in response to the fluctuating patterns of returns available in the markets.

There are many misconceptions about asset classes. Against the belief of safety in bonds, bonds are not necessarily safe investments; volatility in these instruments have been recorded over and again, particularly when inflation is considered. Also, to record asset-liability valuations, mark-to-market (MTM) values are considered, which are not volatility-agnostic. In terms of risk-return trade-off, it has been noticed that there are anomalies; to understand why trustees have such a profoundly mistaken view of risk and return, it is quite necessary to examine the way in which they view liabilities and the kind of actions they take (Sampson, 2008). Pension investment is an alternative setting that circumvents the issue of funding constraints, because managers can shift risk by increasing the volatility of the existing pension assets (Guan &Lui, 2014).

The fund's policy asset mix choice outweighs all other decisions; it directly impacts the fund's investment performance. Active management strategies involving stock selection, sector weighting, or market timing contribute relatively less compared with the impact of long-term allocation to various asset classes set by the guiding investment policy. Therefore, how successfully the fund fulfils its mission rests largely on the choice of and adherence to the ideal asset mix. The strategy around this becomes the anchor (Brinson, Hood, & Beebower, 1986; Brinson, Singer, & Beebower, 1991). According to Arnott (1997), if the asset allocation strategies and policies differ sharply from the strategies and policies of other institutional investors, the results will strongly differ from other institutional compatriots; this is maverick risk.

Recently, EPFO schemes and their returns on investments have been in the news; some of these are quoted here. EPFO garners double-digit returns on equity investments (*The Hindu, August 4, 2016*). 12% returns on equity investments of INR 75000 million (Aug 2015-July 2016). EPFO likely to raise equity investment to 10%. EPFO, at present, invests 5% of investible deposits in ETFs, which is less than 1% of total corpus (*Business Standard, July 24, 2016*). Higher equity share can boost EPF's returns (*Business Standard, August 9, 2016*). Corpus invested in government securities generated 7.5-8% returns, interest rate for FY 15-16 is fixed at 8.8%.

Research Gaps

Studies on Indian pension funds have suffered from paucity of performance data of privately managed pension funds. Unlike the other developed markets, hardly any literature reference was found in the Indian context on the existence of empirical model for asset allocation mix with standard guidelines of functioning of investment systems of privately managed pension funds. Absence of literature in the Indian context on insistence of allocation of investments towards equity prompts a requirement for a critical study of the investment patterns followed and the reasons thereof. The existence of written ethics standards, also called policy guidelines, alters investments in riskier alternative investments as per the long-term objective of the fund (Dobra & Lubich, 2013). It reiterates prior assertions in the literature that asset allocation is the primary determinant of investment returns. Governance has at least an indirect effect on investment performance by affecting these asset allocation decisions.

Research Questions

Based on the motivation for this study, literature review and the research gaps, the following research questions were put forward for the study.

- Are self-managed provident funds in India well organized to carry out their fiduciary responsibilities of managing provident funds in-house effectively?
- Can self-managed provident funds in India earn appropriate returns in the long run?
- How have self-managed provident funds in India performed?
- Would the performance of self-managed provident funds in India have been better if they had invested more in the equity asset class?

Data and Methodology

For this research, we collected primary data from 82 provident fund trusts over a period of 9 years starting from FY06 to FY14. The trusts in our study are spread over 10 different sectors, comprising of self-managed trusts from 18 Public Sector Units, and 64 from private corporates with varying employee sizes and fund sizes (total assets). These funds are further categorized as large, medium and small for analysis purposes. We used stratified random sampling method to address the fairness in distribution and inclusive representativeness of the sample in the study. The sampling spreads were carried out on the basis of size of the funds of the self-managed provident funds, followed by the sectors that they represent from a universe of 1,200 self-managed provident fund entities in India.

Usually, trusts of a similar size tend to have similar practices with respect to investment decisions of their provident fund. To avoid any influence of similar sized trusts on the findings, a wide range of trusts was selected. Our study has a good mix of various sizes of trusts; the categorization of the trusts in terms of their fund sizes in the sample had a count of 26 trusts with fund size range of INR 0-500 million, 11 trusts in the fund size range of INR 500-1,000 million, 8 trusts in the fund size range of INR 1,000-1,500 million, 8 trusts in the fund size range of INR 1,500-5,000 million and 29 trusts with fund size exceeding INR 5,000 million.

As the size of employees is directly proportional to the size of the pension funds, this study encapsulates large, medium and small enterprises. The sample had 7 trusts with 0-500 employees, 20 trusts with 500-1,000 employees, 30 trusts with 1,000-2,500 employees, 9 trusts with 2,500-10,000 employees and 16 trusts with more than 10,000 employees.

The data was collected by questionnaire and personal interviews. The questionnaire was sent beforehand to the trustees followed by meeting them in person at an appointed time. There were no leading questions asked and the questions in the interview were more attributional. The data collected for this research is unpublished data. The sectoral distribution of 82 trusts consisted of corporations from ten diverse sectors like the BFSI (15), FMCG (5), IT (2), Manufacturing (26), Media (1), Petroleum (6), Port (3), Power (1), Services (22) and Telecom (1).

Empirical Model

Asset allocation is the strategy of dividing the investment portfolio across various asset classes like stocks, bonds and money market securities on the presumption that returns on these assets are not correlated and, thus, provide an effective method of diversification. This strategy minimizes risk given a certain expected level of return. To maximize return and minimize risk, the risk-return characteristics of the various asset classes play an important role (Brinson et. al. 1991).

Equities have the highest potential return, but also the highest risk. On the other hand, government securities have the lowest risk since they are backed by the government, but they also provide the lowest potential return. It is generally believed that investment in equities is best suited for investors who have a high risk tolerance and a longer time horizon to recover from losses. Retiral funds in India, particularly, choose the path of avoiding risk altogether and sacrifice higher returns which they can earn from investing in the equity market. The short-term losses in the equity market get cancelled out due to the long-term nature of retiral funds.

In this study, we compared returns from various instruments and various indices to show that the risk-return trade-off that diversification provides through asset allocation is important. Since different assets have different risks and due to market fluctuations, a proper asset allocation of retiral funds will help the funds to achieve higher returns compared to what they are able to achieve now.

Results and Discussions

Financial performance data of the trusts was collected from their annual balance sheet as declared to the IT department. The analysis of their returns was compared with the declared returns of the EPFO (Table-3). The comparison shows that when the EPFO declared less than 9% returns, the majority of the self-managed provident fund trusts achieved better returns than the EPFO. But, when the EPFO declared 9% or more return, there were very few self-managed provident fund trusts which could out-perform the EPFO declared returns.

FY	Number of Trusts which have beaten EPFO returns	Number of Trusts with 10% stocks which would have beaten EPFO returns	EPFO Returns %
2013-14	51	82	8.75
2012-13	72	72	8.50
2011-12	71	0	8.25
2010-11	0	36	9.50
2009-10	60	81	8.50
2008-09	13	0	8.50
2007-08	50	80	8.50
2006-07	20	73	8.50
2005-06	17	80	8.50

Table-3: Comparison of Self-managed trust returns with 10% investment in stocks

The main reason for this was the over-cautious investment pattern followed by the trusts. Moreover, even after the investment guidelines allowing equity investments from the year 2005 onwards was published, there was a complete apathy by the self-managed provident fund trusts towards investing in equity due to lack of clarity and absence of detailed SOP (Statement of Purpose) on equity investments. This was partly triggered due to EPFO Central Board of Trustees not accepting MOF (Ministry of Finance) guidelines on equity inclusion in the portfolio till 2015, which could have been an impediment for the self-managed PF trusts as well. The self-managed provident funds could have undertaken a significant amount of politico-economical risk if they had ignored the stance of the EPFO and Ministry of Labour to invest in equity. A critical study of the investment details along with their asset classes and categories reveal that none of the 82 trusts in the sample had any investments in stocks over the period of the study (9 years). This is despite the fact that from the year 2005, guidelines on investment pattern allowed investments in stocks (Table-1 and 2). The data of the funds show that they invested mainly in government securities and bonds of public sector and private corporates.

Is a diversified portfolio with stocks the panacea for self-managed provident funds?

To answer this query, we calculate delta returns of the portfolios of the 82 trusts using multiple simulations, assuming they had investments in stocks in their portfolio. We replace 10% debt investments in their portfolios, primarily investments in government securities, by BSE 100 (equivalent investments in stocks). Our results presented in Table-3 show that such portfolios of the funds would have generated higher returns than the EPFO declared returns. The results show that in all the years during the period of the study, except for FY09 and FY12, the number of trusts with delta returns over EPFO's declared returns have been higher than the original portfolio returns achieved by the funds. The difference in returns was the result of asset mix or diversification of asset classes in the portfolio mix.

Even in FY11, when the EPFO declared the highest return in the last 9 years, the modified portfolios with 10% exposure to stocks had 36 trusts out-performing the EPFO declared returns. Our study corroborates with studies done in other markets (Susan, 2000; Bauer et. al., 2010) and the proposition that investment in stocks by pension funds would improve returns of the funds.
Furthermore, we test whether the assertions made above are statistically significant, and for this, we carry out the tests by dividing the data in four panels of different time periods ranging from short to long term (9 Year, 7 Year, 5 Year and 3 Year). This would help in identifying the trends in various time periods and would remove any bias for a particular time period. The regression model was built using SPSS regression technique.

$$Y_t = a_i + b_j X_t$$

—where Y_t is the dependent variable-average returns earned by the portfolio originally less risk-free returns (EPFO returns) and X_t is the independent variable-returns earned by the portfolio with 10% equity less risk-free returns (EPFO returns). The resultant models are as follows.

$$Y_9 = -1.057 + 0.971\ X_9$$
$$(0.037)\ (0.022)$$

$$Y_7 = -0.566 + 0.966\ X_7$$
$$(0.029)\ (0.026)$$

$$Y_5 = -1.245 + 0.965\ X_5$$
$$(0.049)\ (0.025)$$

$$Y_3 = 0.196 + 0.998\ X_3$$
$$(0.005)\ (0.007)$$

(Standard errors are given in brackets)

In all the other panels, except the 3 years panel, the alpha a_i is negative; however, the t-test is significant for all the four panels. It shows that the assertion - exposure to 10% equity in the portfolio provides an avenue to earn higher returns than the portfolio with no equity - is statistically significant. A positive value of the constant in the 3 years panel as compared to value of constant in other panels could be interpreted as a result of poor returns from the stock markets in shorter time periods.

As our data from provident fund had a diversified portfolio, we carry out a counter-factual study having a portfolio mix as per 2009 investment guidelines and equity exposure of 10%, 15%, 20% and 30% in the BSE 100. The results of the simulation are shown in Table-4 and are compared with actual benchmark returns earned during the last decade. Results of another simulation with a portfolio mix of BSE 100 and AAA bonds index, instead of investment pattern as per 2009 investment guidelines, is presented in Table-5.

Financial Year	NSE GOI (Crisil composite bond index)	AAA Index	Rolling 1 Yr Liquifex Return (money market)	Rolling 1 Yr I-Bex Return (Gilt MF returns)	BSE 100	EPFO Returns	10% equity portfolio (10% BSE 100, 40% AAA, 45% NSE GOI & 5% MM)	15% equity portfolio (15% BSE 100, 40% AAA, 40% NSE GOI & 5% MM)	20% equity portfolio (20% BSE 100, 40% AAA, 35% NSE GOI & 5% MM)	30% equity portfolio (30% BSE 100, 40% AAA, 25% NSE GOI & 5% MM)
FY 04-05	0.18%	1.26%		-1.40%	17.38%	9.50%	2.33%	3.19%	4.05%	5.77%
FY 05-06	3.30%	3.86%	4.86%	4.08%	69.57%	8.50%	10.23%	13.54%	16.86%	23.48%
FY 06-07	3.75%	3.56%	6.46%	5.82%	11.57%	8.50%	4.59%	4.98%	5.37%	6.16%
FY 07-08	8.22%	10.88%	7.45%	9.06%	24.98%	8.50%	10.92%	11.76%	12.60%	14.27%
FY 08-09	7.35%	13.62%	8.81%	14.66%	-39.97%	8.50%	5.20%	2.83%	0.47%	-4.27%
FY 09-10	5.41%	11.35%	3.69%	4.53%	88.17%	8.50%	15.98%	20.11%	24.25%	32.53%
FY 10-11	5.06%	5.68%	6.21%	6.34%	8.55%	9.50%	5.71%	5.89%	6.06%	6.41%
FY 11 -12	7.70%	8.78%	8.47%	6.71%	-9.23%	8.25%	6.48%	5.63%	4.78%	3.09%
FY 12-13	9.27%	11.49%	8.22%	12.72%	6.84%	8.50%	9.86%	9.74%	9.62%	9.38%
FY 13-14	4.34%	5.36%	9.46%	2.27%	18.11%	8.75%	6.38%	7.07%	7.76%	9.14%

Table-4: Returns in various Instruments (Investment Pattern 2009)

Financial Year	NSE GOI (Crisil composite bond index)	AAA Index	Rolling 1 Yr Liquifex Return (money market)	Rolling 1 Yr I-Bex Return (Gilt MF returns)	BSE 100	EPFO Returns	10% equity portfolio (10% BSE 100 & 90% AAA)	15% equity portfolio (15% BSE 100 & 85% AAA)	20% equity portfolio (20% BSE 100 & 80% AAA)	30% equity portfolio (30% BSE 100 & 70% AAA)
FY 04-05	0.18%	1.26%		-1.40%	17.38%	9.50%	2.87%	3.68%	4.48%	6.10%
FY 05-06	3.30%	3.86%	4.86%	4.08%	69.57%	8.50%	10.43%	13.72%	17.00%	23.57%
FY 06-07	3.75%	3.56%	6.46%	5.82%	11.57%	8.50%	4.36%	4.76%	5.16%	5.96%
FY 07-08	8.22%	10.88%	7.45%	9.06%	24.98%	8.50%	12.29%	13.00%	13.70%	15.11%
FY 08-09	7.35%	13.62%	8.81%	14.66%	-39.97%	8.50%	8.26%	5.58%	2.90%	-2.46%
FY 09-10	5.41%	11.35%	3.69%	4.53%	88.17%	8.50%	19.03%	22.87%	26.71%	34.40%
FY 10-11	5.06%	5.68%	6.21%	6.34%	8.55%	9.50%	5.97%	6.11%	6.25%	6.54%
FY 11 -12	7.70%	8.78%	8.47%	6.71%	-9.23%	8.25%	6.98%	6.08%	5.18%	3.38%
FY 12-13	9.27%	11.49%	8.22%	12.72%	6.84%	8.50%	11.02%	10.79%	10.56%	10.10%
FY 13-14	4.34%	5.36%	9.46%	2.27%	18.11%	8.75%	6.63%	7.27%	7.91%	9.19%

Table-5: Returns in various Instruments (AAA)

In both the simulations as presented in Tables 4 and 5, it can be seen that while EPFO returns have varied by only 125 bps during the time period, yearly returns with the various equity-debt combinations in the simulations have high variability. However, given the variability and risk/return leverages in equity investments, we need to analyze these returns over a longer time horizon. So, we use the simulated returns from the portfolio of 10% stocks (equity portfolio) and 90% fixed income, 15% stocks and 85% fixed income, 20% stocks and 80% fixed income, and 30% stocks and 70% fixed income to extrapolate possible CAGR returns on a fund size of INR 100 over the last 10 years. We compare the value of INR 100 at the end of 10 years with the value generated with EPFO returns over the same period. The results are presented in Figures 2 and 3. For the BSE 100 and investments as per 2009 investment guidelines, the results show that a 10% equity portfolio of BSE 100 is no match for EPFO returns but 15% stocks portfolio out-performed the EPFO value of investment at the end of year 6. In case of a 20% stocks portfolio, it has outperformed the EPFO investment value at the end of year 2 and year 4; year 6 onwards, it consistently delivered a higher value of investment. In case of a 10% stocks portfolio, the EPFO declared returns turn out to be marginally better due to the stock market meltdown in FY 2010 and FY 2013. In case of a portfolio having 30% exposure to stocks, it out-performed the EPFO return portfolio at the end of year 2 onwards consistently; year 5 was the only time it could not match EPFO returns.

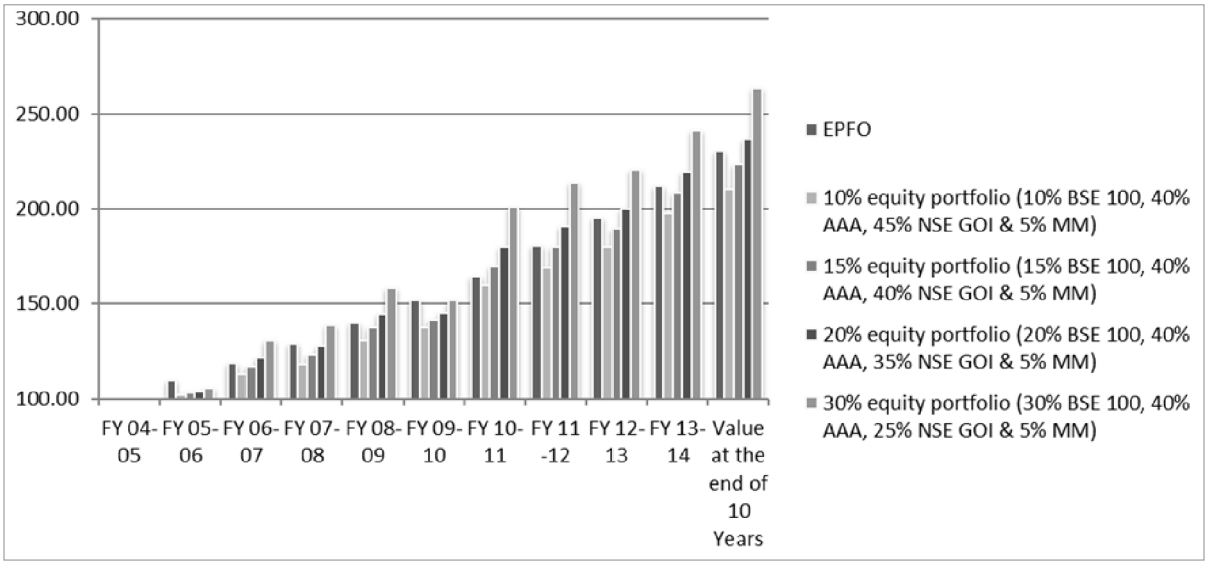

Figure-2: Value of INR 100 in various combinations (Investment Pattern 2009)

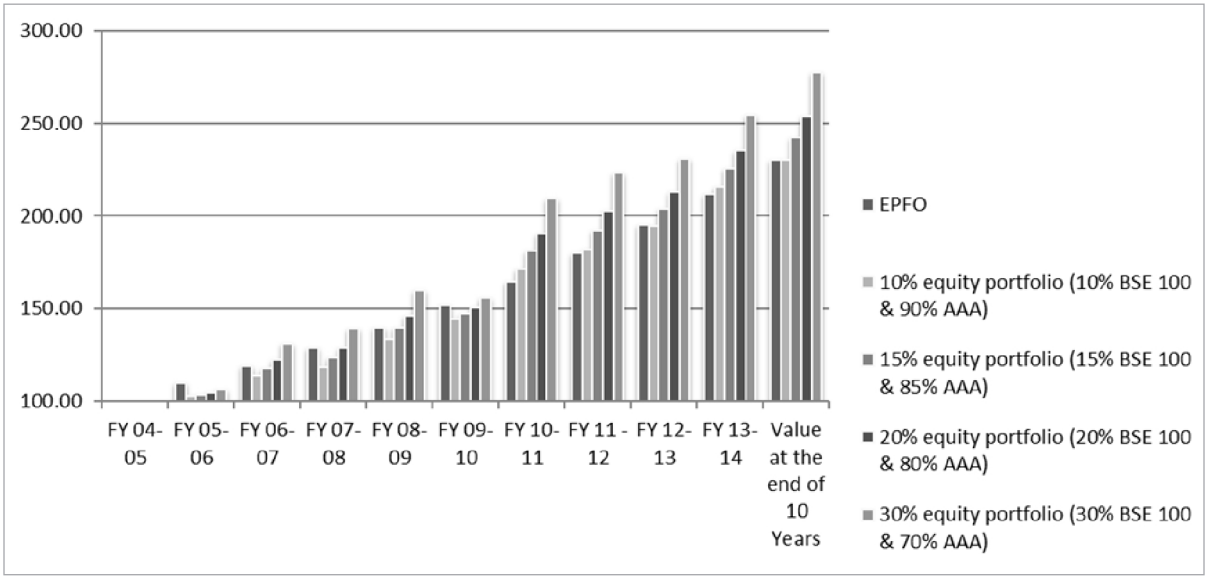

Figure-3: Value of INR 100 in various combinations (AAA 10 Years)

In case of a portfolio with 10% stocks and 90% fixed income (AAA bonds), we find that from the end of year 6, the returns beat the EPFO investment value; however, value of investments at the end of year 10 almost match the EPFO value. The results are similar in case of a portfolio with 15% equity; however, it delivers 5.18% more than the EPFO investment value at the end of year 10. In case of portfolios with 20% and 30% equity, they comfortably deliver an excess delta of 10.35% and 20.53% value of investments at the end of year 10.

To avoid selection bias of using specific equity indices to build hypothetical portfolios for comparisons while inducing equity in the portfolio mix, we equate the various other equity indices as well in the simulations. The returns from these indices on a standalone basis are presented in Table-6. We plot the value of INR 100 invested in various combinations of equity indices (Sensex, Nifty, BSE100, BSE200, and BSE 500) and debt over the 10 years graphically, and find out how they have fared against the EPFO returns over the same period. We used two sets of investment mix; various equity percentages (10%, 15%, 20%, and 30%) in the portfolio mix as per 2009 investment guidelines and with AAA index. From Figure-4, we find that returns with 15% equity combination in the portfolio mix as per 2009 investment guidelines starts matching up with EPFO value of investments, which further extends in case of higher equity percentage combinations.

Financial Year	NSE GOI (Crisil composite bond index)	AAA Index	Rolling 1 Yr Liquifex Return (money market)	Rolling 1 Yr I-Bex Return (Gilt MF returns)	EPFO Returns	Sensex	Nifty	BSE 100	BSE 200	BSE 500
FY 04-05	0.18%	1.26%		-1.40%	9.50%	16.14%	14.89%	17.38%	18.27%	21.89%
FY 05-06	3.30%	3.86%	4.86%	4.08%	8.50%	73.73%	67.15%	69.57%	62.82%	65.17%
FY 06-07	3.75%	3.56%	6.46%	5.82%	8.50%	15.89%	12.31%	11.57%	10.20%	9.71%
FY 07-08	8.22%	10.88%	7.45%	9.06%	8.50%	19.68%	23.89%	24.98%	24.13%	24.25%
FY 08-09	7.35%	13.62%	8.81%	14.66%	8.50%	-37.94%	-36.19%	-39.97%	-40.98%	-42.77%
FY 09-10	5.41%	11.35%	3.69%	4.53%	8.50%	80.54%	73.76%	88.17%	92.87%	96.38%
FY 10-11	5.06%	5.68%	6.21%	6.34%	9.50%	10.94%	11.14%	8.55%	8.15%	7.48%
FY 11-12	7.70%	8.78%	8.47%	6.71%	8.25%	-10.50%	-9.23%	-9.23%	-9.28%	-9.11%
FY 12-13	9.27%	11.49%	8.22%	12.72%	8.50%	8.23%	7.31%	6.84%	6.03%	4.81%
FY 13-14	4.34%	5.36%	9.46%	2.27%	8.75%	18.85%	17.98%	18.11%	17.19%	17.08%

Table-6: Returns from various Indices

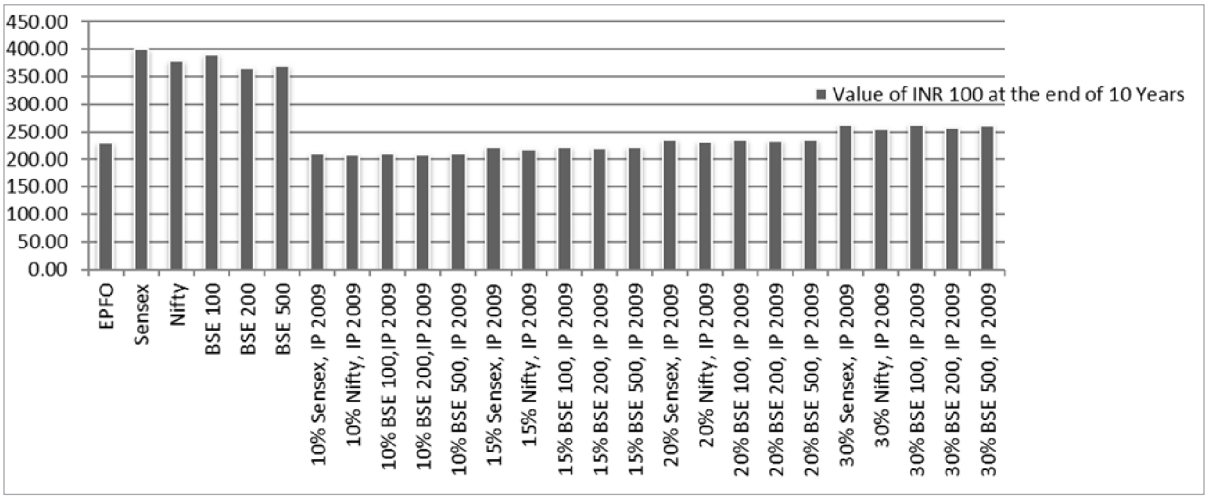

Figure-4: Value of INR 100 in various equity index combinations (Investment Pattern 2009)

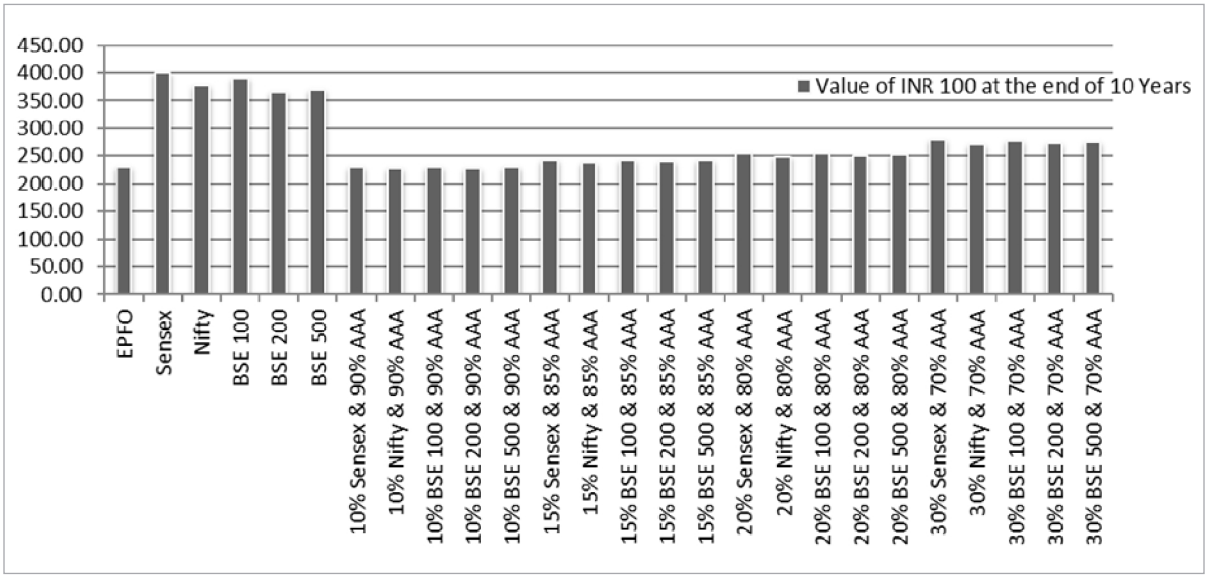

Figure-5: Value of INR 100 in various equity index combinations (AAA 10 Years)

Similarly, we then plot the various equity index combinations with AAA index returns; from Figure-5, we find that returns with 10% equity combination start matching up with EPFO value of investments, which further extends to higher levels in case of higher equity percentage combinations.

The findings from the above simulations reconfirm that diversification of the portfolio with inclusion of equity as an asset class helps in generating higher delta returns over a portfolio of only fixed income investments in the longer term. With introduction of stocks in the portfolio, we found that returns in the long term are greater than the EPFO declared returns over the last ten years from FY2005 to FY2014 (Figures 2, 3, 4 and 5). Our interaction with the self-managed provident fund trustees revealed that an element of over-cautiousness has overwhelmed the trustees' decision to stay invested in government securities, the main reason being volatility of stock markets and trustees' judgment being questioned, especially when markets correct.

Implications of the Study

The research findings suggest a few ideas to ensure importance of diversification of investment avenues across asset classes and incorporation of long-term investment instruments for self-managed provident funds. The findings of the study could create business opportunities for many sub-functions involved in the functioning of self-managed trusts such as trust advisory consultants, stand-alone fund managers, portfolio management service providers, and professional training institutions on modules for trustees, and candidates willing to adopt this as a career option.

This paper envisages that the equity market would deepen with the participation of provident funds, thus, altering the way self-managed pension funds currently conduct investments in India, both in terms of regulatory and market participation. It would also enable and empower self-managed provident funds to actively manage their portfolios.

Limitations of the Study

The study has been conducted on the primary data collected from pension funds. Therefore, it cannot be replicated easily without the exact data points. The data points taken as inputs are the yearly reported returns earned by the trusts; therefore, the analysis of the financial performance for quarterly and semi-annual frequency is not possible from the current data points. Because there is no statute on reporting standards currently, the primary data was collected from a combination of documented and undocumented records, and the trustees of provident funds provided data in good faith.

While conducting the study, utmost care was taken to keep the assumptions unchanged. The impact of the variables like the macro-economic conditions, market conditions, interest rate scenarios, inflation, and political scenarios have not been smoothened in the results.

Areas for further Study

The research findings suggest a few ideas with a view to ensure importance and incorporation of equity investment instruments for retirement benefits funds. From the same data, with sectoral segmentation of current investments, further research can be conducted to evaluate and suggest measures for controlling portfolio risk characteristics for self-managed provident funds. Tenure based equity investments could also be researched to match the fund's demographics and other profiling parameters. From the corporate's or plan sponsor's point of view, a study on the importance of risk liability limitations using asset allocation strategies for retirement funds can be undertaken.

Further, the impact of equity investments by pension funds on deepening capital markets can be studied. Finally, the role of retirement funds in maintaining the standard of living for its members can be investigated.

Conclusions

This study (using counter-factual simulation studies) presents a strong case of changing the investment pattern in favour of inclusion of equity in case of provident funds in India, whether self-managed or in case of the EPFO. This will help in diversification of the portfolio and funds would be able to achieve higher returns. The simulation study shows that between FY2005 and FY2014, self-managed provident funds' corpus could have grown by more than 5.18% under the EPFO (2009) investment guidelines; the returns could have increased by10.35% if a fund had invested 20% of its corpus in stocks as compared with the EPFO returns on investments.

Our study indirectly supports the EPFO policy shift towards participation in stock markets through exchange traded funds (FE Online, 2015; Nanda, 2015). We hope that results of this counter-factual simulation using self-managed provident funds' data provide evidence and confidence to the trustees to invest in stocks to get better returns on their investments.

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