

# An Experimental Study to Develop a Structured Product for Financial Benefits of Investors

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## ABSTRACT

Structured Product constitutes a large industry and an important part of investment and capital market activity. Structured products are financial instruments designed and created for HNI's (High Net-worth Individuals) investors for exposure (to something) through a derivative contract. The objective of Structured Product is to eventually offer principal protection with expectation of Equity like returns.

The researcher after analyzing the research papers, have found that Structured Product has a long way to go. Structured Product plays a key role for HNI's with composition of fixed income and derivative component. The significant combination allows the product to maximize the probability of generating expected returns while keeping the risk level in check. The return of an SP (Structured Product) is linked with performance of Nifty. The returns generated can vary according to rise in level of Nifty. This topic has been chosen by researcher to study and experiment various designs and strategy of developing a SP.

The research design included conducting interviews, carrying out survey about Structured products, and using the secondary sources to meet the objectives of the research. Grounded Theory Analysis has been used by the researcher to analyze the data. The research may provide the readers with detail working of SP with its Strategy of Investment and expected returns.

SP have been around since 2006 in India and is expanding at steady pace with more investors taking notice of their noteworthy performance across these years. Further there is a scope to carry out research on returns of SP by using different derivative component like Foreign currency and commodity market as well and also to increase the performance of SP by generating more returns. Market unpredictability has created a pressing need for products that can not only sustain through the market disorder but also prosper during those phases. So an investor should not only try to prevent the investment from eroding when the market stagnate or fall, but also generate positive returns during that phase. Structured Products(SP) are one such category of products that can be used to generate positive returns across a variety of market Situation.

**KEYWORDS:** Structured Product, High net worth individuals (HNI's), Option Trading, Zero coupon bond, Hedging, Principal Protection

## 1. INTRODUCTION

A structured product is known as market linked instrument which is linked to a zero coupon bond for principal protection and is linked to a derivative component like options like call or put, foreign currency, commodity market. Investor having moderate risk and to who love to have equity like returns invest in SP. There is no single definition of Structured Product as it is a tailor made investment product.

Feature of SP is that it provides Principal Protection in downside market as well. They are often combinations of traditional investments in shares or bonds and financial derivatives. Traditional investments and derivatives are combined in a single financial instrument and securities. Structured Product can be used in diversification of portfolio and also as different investment options.

**How to cite this paper:** Aditya Ramchandra Mhasawade | Pallavi R Gedamkar "An Experimental Study to Develop a Structured Product for Financial Benefits of Investors"

Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-3 | Issue-6, October 2019, pp.244-256, URL: <https://www.ijtsrd.com/papers/ijtsrd28078.pdf>



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The research is about how this Structured Products will benefit the Indian economy, Retail Investors & Financial Institutions. The research will also deal with the Statistical Analysis for designing of various such Structured Products considering various parameters viz age, risk appetite, expected returns, market conditions etc.

The majority of listed structured product issuance is captured by the French (part of Euronext) and German exchanges due to their frequent launch of ultra-short recurring turbo and leveraged certificates. With respect to notional amounts traded, the activity is more evenly spread out amongst large European exchanges including those in Switzerland, Germany, France and Luxembourg, leading to extremely small order size in countries with large issuance.

Structured products are used by investors who do not have knowledge about market but expect the equity like market returns. About 80% of the structured products issued in the country are pegged to the Nifty index, according to bankers. The top local issuers include Kotak Securities Ltd and Edelweiss Capital Ltd.

## 2. Objectives

### 2.1. Objective

The researcher is trying an experiment to develop a Structured Product as it is a growing product in India. The other instruments of investments also generate adequate returns but with a factor of risk. Structured Products is designed specially for its principal protection with generating adequate returns. So following are the main objectives of researcher so that there would be a demand for Structured product.

1. To design a Structured Product considering all Financial aspects of Investors.
2. To develop various Diversification Strategies of Option Trading for Investment.
3. To calculate effect of Option Trading on Return of Structured Product.

## 3. Industry Profile

### Financial Service Industry



Financial service industry comprises such organizations as commercial and investment banks, insurance companies, hedge funds, credit-card companies, consumer finance firms, accounting agencies, and brokerage firms. The industry's services are mainly related to banking and insurance services, asset management, investments, foreign exchange, and accounting.

Financial services form the lifeblood of economic growth and development. They facilitate the setting up of big and small businesses and the expansion of businesses. Employment and entrepreneurship created with the help of the services enable people to earn and save.

Financial services show the poor ways out of poverty and of leading better lives. To the wealthy, financial services offers opportunities to make money grow.

The financial services industry is the largest-earning sector in the world. Through interventions in industry and agriculture and other formal sectors, they provide lines of credit and investment.

## 2.2. SCOPE

Structured Products are creating demand in Indian market due to volatility and these products have attracted both new and existing stock market investors. Volatile markets have made the existing investors a bit cautious and they want some downside protection for their stock investment. Besides protection it's the need for alternative way of investing in stocks that is driving the growth of these products.

1. The study is conducted in context to HNI clients from Pune city, Maharashtra.
2. The study has undertaken Unstructured Personal and Telephonic interviews of HNI clients along with Questionnaire floated through mail.
3. Study has considered the market analysis of Nifty 50 indices with its past performance and growth prospect.
4. Study of similar financial Instruments with principal protection was also carried out.
5. The feature of SP attracts aggressive investors as well as risk averse investors to invest in SP.
6. SP are designed as per investor specific demand as they are tailor made investment instruments. So the payoff may vary accordingly.

The financial services sector in India, which accounts for 6 percent of the nation's GDP, is growing rapidly. Although the sector consists of commercial banks, development finance institutions, nonbanking financial companies, insurance companies, cooperatives, mutual funds, and the new "payment banks," it is dominated by banks, which holds over 60 percent share.

The Reserve Bank of India (RBI) is the apex bank of the country, controlling all activities in the financial sector. Commercial banks include public sector and private sector banks and are under the regulatory supervision of the RBI. Development finance institutions include industrial and agriculture banks.

## 4. Company Profile

The Edelweiss Group is one of India's leading diversified financial services company providing a broad range of financial products and services to a substantial and diversified client base that includes corporations, institutions and individuals. Edelweiss's products and services span multiple asset classes and consumer segments

across domestic and global geographies. Its businesses are broadly divided into:

- Credit Business (Retail Credit comprises of Retail Mortgage, SME and Business Loans, Loan against Securities, Agri and Rural Finance, Corporate Credit comprises of Structured Collateralised Credit to Corporates and Wholesale Mortgages).
- Franchise & Advisory Business (Wealth Management, Asset Management including Distressed Assets and Capital Markets).
- Insurance (life and general insurance).

The Balance Sheet Management Unit operations manage the liquidity and Balance Sheet. Edelweiss has an asset base of INR 55,100 crore with revenue of INR 8,623 crore and PAT of INR 890 crore for FY18. Its consistent performance is evidenced by a consolidated PAT CAGR of 38% over last 28 quarters. The Group's research driven approach and proven history of innovation has enabled it to foster strong relationships across all client segments.

The group has sizeable presence in large retail segment through its businesses such as Life Insurance, Housing Finance, Mutual Fund and Retail Financial Markets. It serves a 12-lac strong client base through over 10,000 employees based out of over 450 offices. Together with strong network of Sub-Brokers and Authorized Persons, Edelweiss group has presence across all major cities in India. Edelweiss Financial Services trades under the symbols NSE: EDELWEISS, BSE: 532922, Reuters: EDEL.NS and EDEL.BO and Bloomberg: EDEL IS and EDEL IB. Edelweiss stock is covered by sell side research analysts of Morgan Stanley, ICICI Securities, SBI Cap Securities, Maybank Kim Eng Securities, Credit Suisse Securities, Haitong International, Citi Research, Emkay Global Financial Services, Ventura Securities, Monarch Network Stockbroking, First Call and Aditya Birla Money.

#### 4.1. Company Business

##### 1. CREDIT (CREATING WEALTH)

###### ➤ RETAIL CREDIT

The consumption wave led by India's young population, has fuelled the massive growth in retail credit. Simultaneously, small and medium enterprises which contribute to over a fifth of India's GDP are now looking at relevant financing solutions in order to take their businesses to the next level.

Despite this, retail credit in India continues to be under-penetrated, be it in mortgages, SME, Agri-credit or microfinance, thereby offering an increased scope for financing to entrepreneurs and business owners.

The Government's push towards creating a digital financial footprint for the nation and the resultant democratisation of credit will help drive growth in this segment.

At Edelweiss, we have a robust retail credit offering and solutions that are designed to address an array of financing needs.

Our wide footprint across the country, enables us to promptly and efficiently cater to a cross section of customers, across Entrepreneur's, Business Owners, MSMEs and SMEs, offering them quick turnaround times, helping them deploy the funds faster.

#### Business highlights (as on March 31, 2018)

- Retail credit book of Rs. 161.88 billion
- 81% Y-o-Y growth
- Increased location footprint

#### ➤ CORPORATE CREDIT

As India retains its position as one of the fastest-growing economies, corporate India increasingly seeks quality capital to finance their expansion and new projects.

At Edelweiss, we aim to fulfil the financing requirements of corporate India through a wide range of customised structured solutions to help companies meet their liquidity and investment needs.

With a wide variety of clients that include Indian corporations, multinational companies and financial institutions, we also help promoters leverage their shareholding to meet funds required for expansion and diversification of their businesses.

The success of these offerings is built on the back of a solid team focused on ensuring high standards of risk and compliance as well as efficiency in operations and service delivery to clients.

#### Business Highlights (as on March 31, 2018)

- Corporate Credit book of Rs. 195 billion
- 41% increase y-o-y in capital employed
- Scaling up Corporate Credit through co-investment from Asset Management fund

## 5. Literature Review

### 5.1. The Application of the Long and Short Combo Option Strategies in the Building of Structured Products by Technical University of Košice, Faculty of Economics, Department of Finance Némcovej 32, 040 01 Košice, Slovak Republic, JEL Classification: G15, G11, 1984.

Aim is to analyze some of the existing structured products and to prove that their creation is possible by utilizing option strategies known as the Long and Short Combo.

It can be stated that practically every structured product has a certain option element built in it. If the value of the underlying asset is fundamental for the payment of a bonus yield only at maturity of the given structured product, then the so-called vanilla options were certainly used in its creation. Otherwise, more complicated barrier or other so called exotic options were used.

Structured products with a limited bonus yield are popular with many investors especially in times of increased volatility. We have demonstrated in this work that they can be created by combining an underlying asset with Long or Short Combo option strategies, where the expiry date of used options is identical with the maturity of the guaranteed product.

### 5.2. Trading in Pennies – A survey of the issues by Lawrence harris, marshal School of Business, NYSE conference, Scottsdale Arizona, 1999.

The effect that trading on pennies will have on Investors, Dealers, Brokers, Exchanges. Investors must consider how to trade in penny stocks considering various conditions like



cost involved and also about the demand and supply of that penny stock.

All market have a minimum price movement called tick size that determines set of prices traders may use. Increment is infractions.

So investment in large quantities will only result in more Profits as due to less movement in Price of Penny Stocks.

### **5.3. Optimal Hedging with Basis Risk by Mark H.A. DAVIS, Department of Mathematics, Imperial College London, 60H07, 60H30, 2004.**

Options are written on underlying assets that cannot be traded directly, but where a 'closely related' asset can be traded. Rather using simple option strategy one should develop various hedging strategy. Traders usually had excellent intuition about the sensitivity of option values to various modelling assumptions and parameter values. Correlation was however one area where their intuition sometimes seemed mis-calibrated.

If one is hedging a book of equity options, for example, then by far the cheapest things to hedge with are index futures: the transaction costs for trading the underlying securities themselves are an order of magnitude higher. Since the (return) correlation between a representative basket of stocks and the index is very high – perhaps 80% – most traders were perfectly happy to hedge using the index as a “proxy” asset, but had very little idea what the residual risk was in doing so.

### **5.4. Option Spread and Combination Trading by J. Scott Chaput & Louis H. Ederington, University of Otago, 405-325-5591, 2002.**

The most traded combination for option spreads are: straddles, ratio spreads, vertical spreads, and strangles. Traders use this strategies or combination of these strategies using multiple ways considering various risk and return conditions.

The most suitable combination will yield good returns in portfolio. Spreads and 2 combinations have quite different risk exposures than ordinary calls and puts and that a majority are designed to be highly sensitive to volatility and relatively insensitive to changes in the underlying assets price.

Option spreads and combinations are very actively traded and Beneficial.

### **5.5. Asset Allocation with Inflation – Protected Bonds by S.P Kothari and Jay Shanken, AIMR Education Conference, vol 77, no-4, USA 2004.**

The T bonds and Inflation forecasting model is to create a series of Hypothetical indexed bond returns. The real return on indexed bonds are less volatile than the returns on other similar conventional bonds.

Thus Indexed Bonds provide better opportunities for diversification in a portfolio of stocks and bonds than do conventional Bonds.

The asset allocation is done with T bonds and also with the zero coupon bond.

### **5.6. METHOD OF EVALUATING AN OPTION SPREAD by David Wender, Int. Cl. G06O40/00, US 7,930,227 B2, New York US, 2011.**

Options spread is based upon the relationship between the strike price and maturity. A method for determining a type of option spread based upon options received from an input device. The method comprises receiving a sequence of options, comparing each option with each other option, assigning a quantity for each option, and determining a type of option spread based upon the comparison of each option with each other option and the assigned quantity of each option.

Options spreads are the basics of investment Strategies of investment. A spread position is taken by buying and selling of underlying asset using different spreads to generate adequate returns. So it helps in generating more profits and enhancing the Portfolio.

### **5.7. Returns & Volatility of Low Grade Bonds by Marshall E Blume, Sandeep A Patel, Rodney L. White Center for Financial Research, University of Pennsylvania, PA 19104 – 6367, 1989.**

Low Grade Bonds gives higher returns than Higher Grade Bonds and lower returns than common stocks. Also low Grade Bonds exhibits less volatility than Higher Grade Bonds due to their call features and high coupons.

Low Grade Bonds behave both Bonds Stocks. The other classes are Treasury Bonds, Corporate Bonds, S&P 500 and small capitalization stocks.

So unlike other realized returns, the returns for Low Grade Bonds is stable over time and is always less variant than other Bonds.

### **5.8. A Study on “Optimizing Returns through Developing Effective Option Trading strategy: With Reference to Stock Options Traded in National Stock Exchange”**

Options are used as risk management tools which are used worldwide. Options are a type of derivative instruments which will offer only the right but not the obligation to trade in a specific underlying asset.

Call option buyer has to buy the Call option so he has the right to exercise this at any time. When he buys the call option he at the price of premium value that he pays for.

Therefore option traders must be very careful while deciding on the price of an option contract that is the premium. It is a well known fact that premium outlay can be minimized by effectively implementing option trading strategies

### **5.9. Zero-Coupon Yield Curve Estimation by Robert Ferstl University of Regensburg & Josef Hayden University of Regensburg, 1977.**

The term structure of interest rates defines the relationship between the yield of a fixed income investment and the time to maturity of its cash flows.

The zero-coupon yield graph provides the relationship for investments with only one payment at maturity. It serves as the basis for the valuation of other fixed income instruments and as an input for various models, e.g., for risk management, monetary policy, derivatives pricing.

Two very fundamental fixed income securities are discount or zero-coupon bonds and fixed-coupon bonds. So using this zero coupon bond for principal protection for SP.

#### 5.10. The Long Bond by Ian Martin & Steve Ross, Martin: Stanford GSB. Ross: MIT Sloan, June 2013.

A zero-coupon bond that pays off in the far-distant future, under the assumptions that (i) the fixed-income market is complete and (ii) the state vector that drives interest rates.

A long bond is considered as safest bond and it is also traded in the world. This attracts the International buyers even in unsuitable economic condition.

But a long bond is held for too many years at least 20-30 years, so for Structured product it is not a suitable bond rather zero coupon bond is favorable.

#### 5.11. The Impact of Derivative Trading on Spot Market Volatility: Evidence for Indian Derivative Market by Koustubh Kanti Ray & Ajaya Kumar Panda, Vol. 1, Issue. 7, July 2011(pp.117-131)

The aim is to analyze the effect of the introduction of derivatives on the volatility of the Indian stock exchange. This study addresses issues: the study analyses the stock market volatility in the pre and post derivative period.

The result shows that some stocks have experienced changed after introduction of derivative component and it has affected its price also.

The Derivative have created an impact on spot market which has created much volatility in market.

## 6. Research Methodology

### 6.1. Statement of Problem

Determining the returns generated by Structured Product and to have an experimental study to develop a Structured Product generating maximum returns considering all financial aspects of Investors.

### 6.2. Hypothesis

On the basis of related literature review and on the basis of preliminary discussion among colleagues, senior faculty members and research guides, researcher has collected several aspects and facts related to the topic. On the basis of these initial discussions and learned opinion, researcher has formulated following hypotheses

H0 = Structured Product will generate maximum returns which will increase profits in portfolio of Investors.

H1 = Structured Product will not generate maximum returns which will increase profits in portfolio of Investors.

### 6.3. Research Design

A research design is the scientific approach used by the researcher to conduct his study. It is an overall integration of identified and relevant components and data resulting in an appropriate outcome. To come up with accurate results, researcher must use strategic methodology which is in line with type of research chosen.

In this study, the experimental and exploratory research design was chosen in order to explore how Structured product will generate maximum returns by various diversification strategies considering all financial aspects of Investors.

It is proposed to carry out research in following different steps.

- In the first step, Interviewing people with High Net Worth Individuals (HNI's) in Pune city.
- Separate questionnaires for HNI's to know about their view and understanding about Structured Products.
- Telephonic Interview with clients having invested in SP's and reviews about it.
- In the fourth step based on the observations and findings, appropriate progress and challenges will be identified for designing of Structured Product by considering various Financial parameters & its growth in India.

### 6.4. Sampling

Simple Random Sampling Method takes small portion of the total population to represent entire population. It is one of the simplest sampling techniques. In this study, out of all the known contact some of them are chosen to test the hypothesis and thus simple random sampling technique has been used.

Sample: High Net worth Individuals (HNI's)

**Table: Sampling**

Particulars	HNI's
Universe	20
Sample size	15

Source: Data collected by researcher

### 6.5. Data Collection

Qualitative Research method focuses on obtaining data through open ended and conversational communication. The results of qualitative data are more descriptive and the inferences can be drawn quite easily from the data that is obtained.

In this study, the data gathered was subjective in nature. Questions were built on information gathered through secondary sources and existing knowledge about the domain. Data was recorded in written format and documented with the help of electronic media.

Data Collection Source:

Primary Data – Questionnaire and Personal Interview.

Secondary Interview – Data of Existing customers

Data Analysis Source:

Data being qualitative in nature, it is analyses by grounded analysis.

## 7. Data Analysis and Interpretation:

### Hypothesis Testing:

Hypothesis testing is an act in statistics whereby an analyst test an assumption regarding a population parameter, the methodology employed by the analysts depends on the nature of the data used and the reason for the analysis.

Here the researcher has applied one sample T-test which is used to determine whether a sample comes from a population with a specific mean, this population mean is not always known but is sometimes hypothesized

### Scenario:

Researcher has launched a new structured product & claims that under normal circumstances the average returns on investment of this structured product will be atleast 10%.

Investors	1	2	3	4	5	6	7	8
ROI (%)	9	10	10.2	10.5	11	10.8	10	9.4
Dummy	0	0	0	0	0	0	0	0

The average Return on investment in this structured product is atleast 10 %.

#### Analysis:

##### ➤ Setting Null and Alternate Hypothesis:

Null Hypothesis:  $H_0: \mu = 10$

Alternate Hypothesis:  $H_1: \mu \neq 10$

##### ➤ Level of Significance:

$\alpha = 0.05$

##### ➤ Setting Decision Parameter:

Accept  $H_0$  if  $P > 0.05$

Or else Accept  $H_1$

t-Test: Two-Sample Assuming Unequal Variances	
	ROI (%)
Mean	10.1125
Variance	0.455535714
Observations	8
Hypothesized Mean Difference	10
Df	7
t Stat	0.471450717
P(T<=t) one-tail	0.325829665
t Critical one-tail	1.894578605
P(T<=t) two-tail	0.65165933
t Critical two-tail	2.364624252

Table no: Hypothesis Testing

#### Test Result:

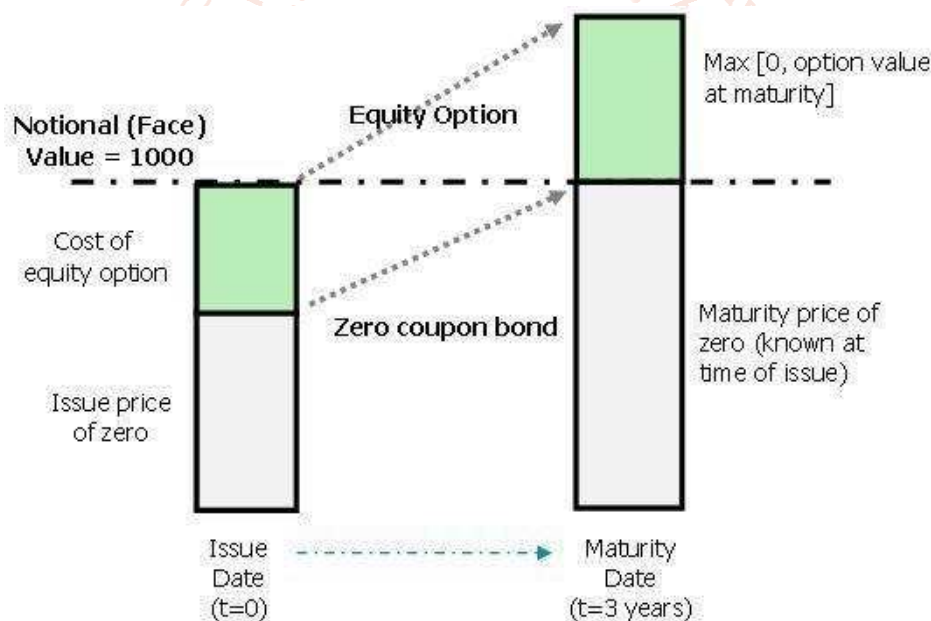
As,  $P(0.6516) > 0.05$ , Null hypothesis is accepted.

At 5 % level of significance, the null hypothesis is accepted.

#### 7.1. Following data is examined for the objective “Design of Structured product considering all financial aspects”.

The Structured Product consist of a zero coupon bond for principal protection with lock in period of 3 years and a derivative instrument which gives equity like returns. Considering on the issue date, you pay the face amount of 100. This note is fully principal-protected, meaning you will get your 100 back at maturity no matter what happens to the underlying asset. Principal is protected by issuing a zero-coupon bond accreting from its original issue discount to face value.

For the performance component, the underlying asset is priced as a European call option and will have intrinsic value at maturity if its value on that date is higher than its value when issued. If applicable, you earn that return on a one on one basis. If not, the option expires worthlessly and you get nothing in excess of your 100 return of principal.



Source: Anand Rathi SP's design

#### Capital Protected Structure

Minimum amount invested	Rs 10,00,000.
Principal Protection	Principal is protected at maturity up to face value only.
Tenor	36/42 months
Entry level	Average of closing levels of Nifty 50 on primary issuance date and next two months expiry.
Exit level	Average of closing levels of Nifty 50 on 34 <sup>th</sup> to 36 <sup>th</sup> month from primary issuance date.
Upside participation	100% upside of Nifty 50 returns.
Inflation rate	7%
Expected Return	10%

Source: Based on back-tested data from Jan 2010 till Jan 2019 covering 2200 observations. Back-testing/Past performance is not an indication of Future returns (Inflation rate is taken considering the SEBI guidelines).

**Analysis**

Return is minimum or maximum of 0% and returns on the underlying option- Participation Rate \* Underlying Returns \* Barrier

Underlying Returns means index levels on specific dates / days (observation dates) as defined versus the original index value (initial date)

Participation means the returns on the underlying and the leverage factor – meaning for instance if the markets go up by 10% and option returns 10%, the participation rate is 100%. These returns are typically capped/floored at certain conditions. If Nifty goes below or above our strike price, the value of return will depend accordingly.

**Example –**

Assume investor buys a three-year 100% principal protected Equity-Linked Note with 80% participation in the upside of the S&P Nifty Index for Rs. 100.

- The starting index level is 500. At maturity, if the S&P Nifty Index level is above 500, then the payoff of the note will be Rs. 100 in principal plus an equity-linked coupon equivalent to any increase in the index.
- if the index level in five years is 625 (an appreciation of 25%), then the coupon would be Rs. 20 (80%\*25%\*100) and the total payoff would be Rs. 120 (100 + 20).

If the index level is below 500 at maturity, i.e., the underlying equity performance is negative, the final payoff to the investor will be Rs. 100 in principal.

**7.2. Following data is examined for the objective “To calculate the effect of Option on return of Structured Product”.**

The Structured Product consist of zero coupon bond for principal protection and is linked to a derivative component (Nifty 50) for returns. The product is linked to derivative component (Nifty 50) to generate returns so these returns would depend on the growth of the Nifty 50.

Options may be categorized as call and put options. We can go for long or short position for these options. But there is a risk involved in these long and short positions in call/put options with certain rewards they are mentioned below

	Risk	Return
Long	Premium Paid	Unlimited
Short	Unlimited	Premium received

Source: Based on Equity Derivative NISM.

So as per the back-tested data of Nifty 50 and calculating Option Premium using Option pricing model we will be able to estimate the returns of Structured Product

**Analysis**

The graph shows the growth of NIFTY 50 Index from year 2010 to 2019. The table shows that there is good growth in NIFTY 50 during a period of 3 years.

**Nifty 50 growths for 3 years period from 2010 to 2019**

- **2010 to 2013: 13.55% growth.**
- **2013 to 2016: 33.8% growth.**
- **2016 to 2019: 36.83% growth.**

NIFTY has shown good returns with increasing returns for period of 3 years.

The table shows the growth of NIFTY 50 year on year.

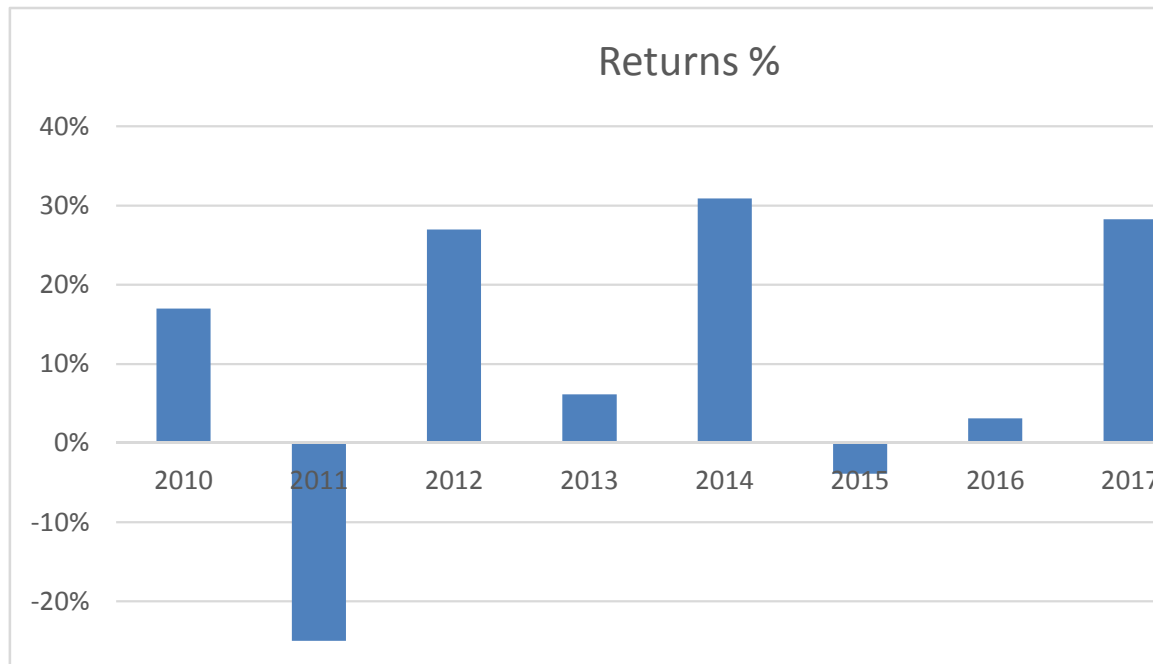
**Year wise growth of Nifty 50**

Year	Growth
2010	17%
2011	-25%
2012	27%
2013	6.18%
2014	30.9%
2015	-3.9%
2016	3.1%
2017	28.3%
2018	3.14%

Source: Returns calculated by Researcher based on NIFTY 50 data



## Nifty 50 Growth year on year:



Source: Returns calculated by Researcher based on NIFTY 50 data

## Nifty 50 line chart



Source: Line Graph of NIFTY 50 using Zerodha Trading Application Software

## Options Pricing Fundamentals

Options premium prices are not fixed by SEBI or by stock exchange or anybody for that matter. Price discovery is a very crucial component of stock market. Stock exchange only provide platform where buyer's and seller's meet and SEBI's role is to ensure smooth functioning of our markets.

Thus there are five fundamental parameters on which the option price depends

- Spot price of the underlying asset
- Strike price of Option
- Volatility of the underlying asset's price
- Time to expiration
- Interest Rates

There are various option pricing models which traders use to arrive at the right and particular value of the option. The Black & Scholes Model is used for calculating the theoretical Option Price (OP).

$$OP = SN(d1) - Xe^{rt}N(d2)$$

$$\text{Where, } d1 = \frac{[\ln(s/n) + (r + (v^2/2)t)]}{v(t)^{1/2}}$$

$$d2 = d1 - v(t)^{1/2}$$



And the variables are

- S = Stock price
- X = Strike Price
- t = time remaining until expiration, expressed in years
- r = current continuously compounded risk free interest rates
- v = volatility of stock price
- ln = natural logarithm
- N(x) = standard normal cumulative distribution function
- e = exponential function

#### FPI and FII investment Details Year on Year

Year	Total (INR-Crores)
2010	179673.9
2011	39352.9
2012	163347.9
2013	62286
2014	256213
2015	63663
2016	-23079
2017	200048
2018	-80919
2019(Till Aug)	87474

Source: National Securities Depository Ltd. (NSDL)

From the above charts and table of Nifty 50 returns and growth from the year 2010 to 2019 it indicates a good sign for the returns of Structured product. Also the investment of FII and FDI have been considerably good from 2010 to 2019.

So linking the Structured Product with derivative component like Nifty 50 Index would give us good returns considering all financial aspects and the past data with the growth of Nifty 50 and also with investment opportunities for Foreign Institutional Investors and Foreign Portfolio Investors (FII/FPI) in developing country like India.

#### 7.3. Following data is examined for the objective “To develop various Diversification strategies of Option Trading for Investment”.

##### Different Investment Options

There are many instruments for investment in today's world which can give good returns according to its risk. Structured products comparatively give good returns with full principal protection as well as partial principal protection. There are debt as well as equity based Structured Products.

So for principal protection as well as for diversification of Portfolio Structured Products are used in India. The table below shows the Risk vs Returns of different investment instruments.

#### Comparison Risk/Return

Instrument	Principal Protection	Liquidity	Risk	Potential Returns
Fixed Deposits	Yes	Medium	Low/None	Low
Direct Equity	No	High	High	High
Derivatives	No	High	High	High
Structured Products	Yes -Optional	Low	Low/Medium	High

Source: Investing.com website

#### Analysis

##### Option Spreads

Spreads involve combining options on the same underlying and of same type (call/put) but with different strikes and maturities. These are limited profit and limited loss positions. They are categorized as

- Vertical Spreads
- Horizontal Spreads
- Diagonal Spreads
- Straddle
- Strangle
- Covered Call
- Protective Put
- Butterfly Spread

**Vertical Spreads**

Vertical Spreads are created by using options(call/put) having same expiry dates but different strike prices. Further these can be created either using calls as combination or puts as combinations. These are further classified as:

- Bullish Vertical Spread
  - Using Calls
  - Using Puts
- Bearish Vertical Spread
  - Using Calls
  - Using Puts

**Horizontal Spreads**

Horizontal spread have same strike prices are same type but different expiry options. This is also known as time spread. Underlying reasoning behind horizontal spreads is that these two options would have different time values and the trader believes that difference between the time values of these two options would shrink or widen.

**Diagonal Spread**

Diagonal Spread is a combination of options having same underlying but different expiry dates as well as different strike prices. These are much more complicated in nature and in execution.

**Analysis of Call Option Trading**

The spot price of Nifty on March 1, 2018, was 10460. Consider call options with strike prices of 10300, 10400, 10500 and 10600. A call option buyer will buy the option and pay the premium upfront. The premium for various strike prices are:

Strike prices	Premium
10300	170
10400	115
10500	72
10600	34

Source: Past Nifty 50 data

The 10300 strike call option is deep in the money and has an intrinsic value of  $10460 - 10300 = 160$ . Hence the Option premium will be at least equal to this value. The remaining portion of the premium is the time value ( $170 - 160 = 10$ )

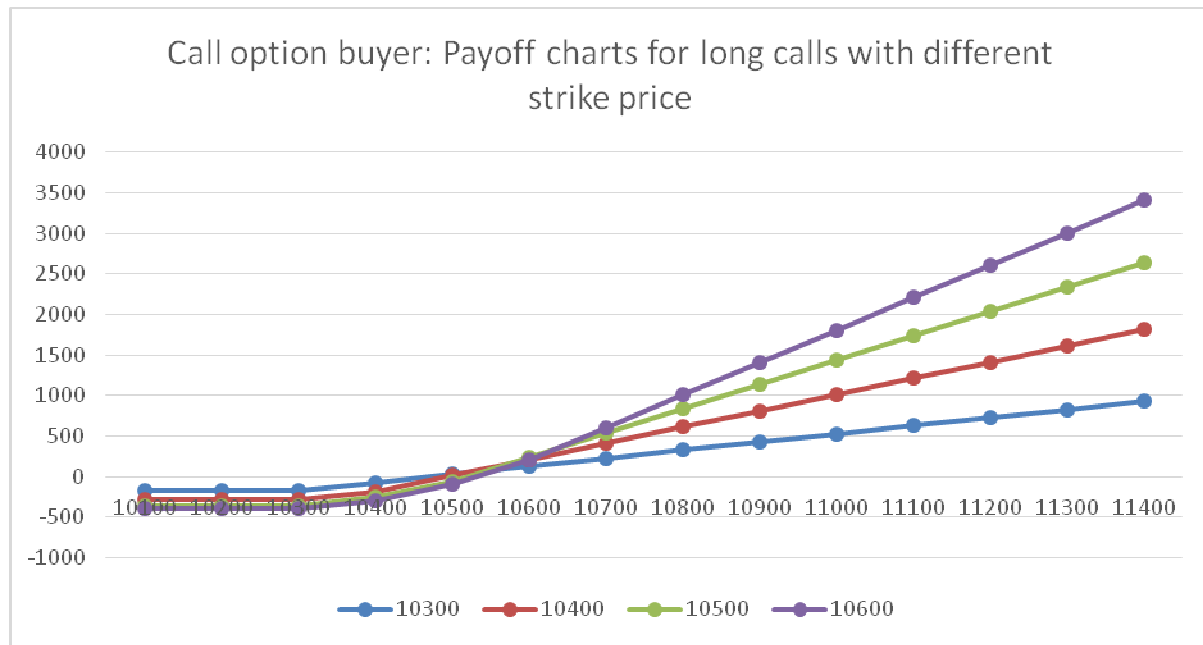
The 10600 strike call option is out of the money option. There is no intrinsic value here. The entire option premium is attributed to risk associated with time value.

If Nifty closes below 10300 at expiry all options will expire out of the money i.e. they are worthless. The greatest loss will be for option with strike price 10300 (Rs 170) and least loss will be incurred on strike 10600 option (Rs 34).

**Payoffs for call option with different strikes and premiums**

Nifty X	10300	10400	10500	10600
Closing P	170	115	72	34
Expiry BEP	10470	10515	10572	10634
10100	-170	-115	-72	-34
10200	-170	-115	-72	-34
10300	-170	-115	-72	-34
10400	-70	-115	-72	-34
10500	30	-15	-72	-34
10600	130	85	28	-34
10700	230	185	128	66
10800	330	285	228	166
10900	430	385	328	266
11000	530	485	428	366
11100	630	585	528	466
11200	730	685	628	566
11300	830	785	728	666
11400	930	885	828	766

Source: Data collected by researcher



Source: Data collected by researcher

### Profitability for Call Options Trading

When a buyer is bullish on Nifty he can buy call option with any strike price. The choice of option would be better understood with return on investment (ROI). ROI is net profit as a percentage of premium paid by option buyer.

If Nifty goes up to 10700 at maturity then ROI will be

1. Profit on strike price 10300 will be  $10700 - 10300 - 170 = 230$   
Return on investment =  $230 / 170 = 135\%$
2. Profit on strike price 10400 will be  $10700 - 10400 - 115 = 185$   
Return on investment =  $185 / 115 = 161\%$
3. Profit on strike price 10500 will be  $10700 - 10500 - 72 = 128$   
Return on investment =  $128 / 72 = 178\%$
4. Profit on strike price 10600 will be  $10700 - 10600 - 34 = 66$   
Return on investment =  $66 / 34 = 194\%$

### Analysis of Put Option Trading

The Spot price of Nifty on march 1 2018, was 10460. A person bearish on Nifty can buy a put option of any strike available. Consider put options of strike prices 10300, 10400, 10500 and 10600. Premiums of each are given below

Strike prices	Premium
10300	125
10400	173
10500	221
10600	290

Source: Past Nifty 50 data

The 10600 strike put option is deep in the money and has an intrinsic value of  $10600 - 10460 = 140$ . Hence the Option premium will be at least equal to this value. The remaining portion of the premium is the time value ( $290 - 140 = 150$ )

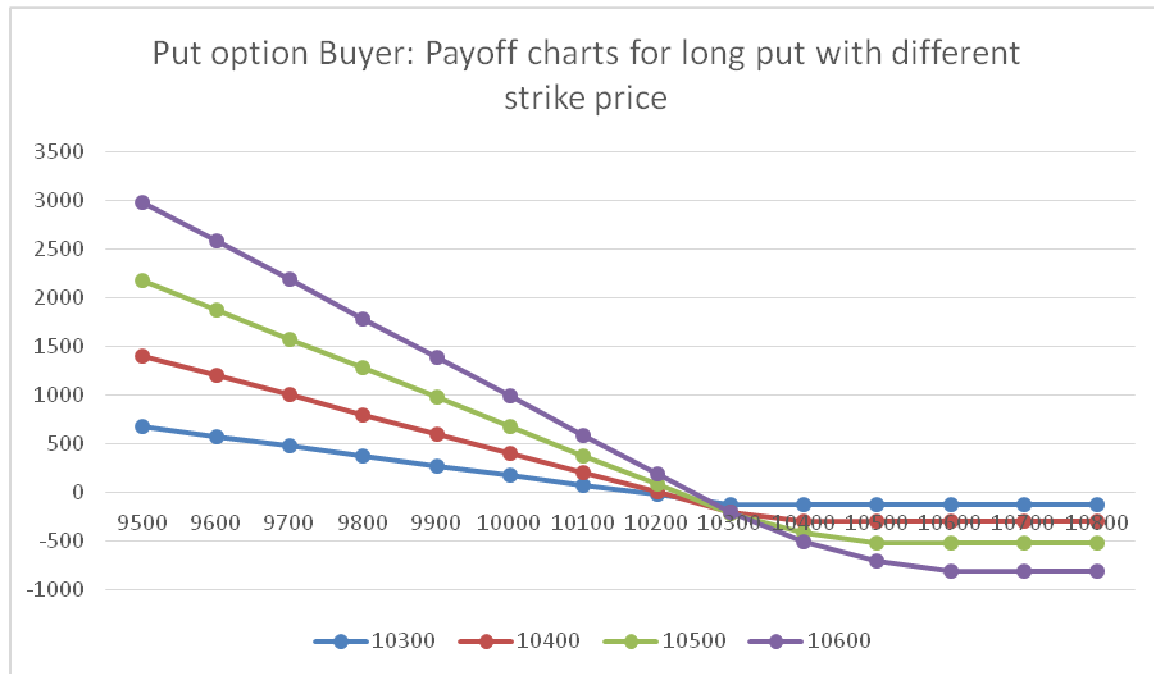
The 10300 strike call option is out of the money option. There is no intrinsic value here. The entire option premium is attributed to risk associated with time value.

### Payoffs for Put option with different strikes and premiums

Nifty X	10300	10400	10500	10600
Closing P	125	173	221	290
Expiry BEP	10175	10227	10279	10310
9500	675	727	779	810
9600	575	627	679	710
9700	475	527	579	610
9800	375	427	479	510
9900	275	327	379	410
10000	175	227	279	310
10100	75	127	179	210

10200	-25	27	79	110
10300	-125	-73	-21	10
10400	-125	-173	-121	-90
10500	-125	-173	-221	-190
10600	-125	-173	-221	-290
10700	-125	-173	-221	-290
10800	-125	-173	-221	-290

Source: Past Nifty 50 premiums



Source: Data collected by researcher

### Profitability for Put Options Trading

When a buyer is bearish on Nifty he can buy Put option with any strike price. The choice of option would be better understood with return on investment (ROI). ROI is net profit as a percentage of premium received by option buyer.

If Nifty falls to 10000 at maturity then ROI will be

1. Profit on strike price 10300 will be  $10300 - 10000 - 125 = 175$   
Return on investment =  $175 / 125 = 140\%$
2. Profit on strike price 10400 will be  $10400 - 10000 - 173 = 227$   
Return on investment =  $227 / 173 = 131\%$
3. Profit on strike price 10500 will be  $10500 - 10000 - 221 = 279$   
Return on investment =  $279 / 221 = 126\%$
4. Profit on strike price 10600 will be  $10600 - 10000 - 290 = 310$   
Return on investment =  $310 / 290 = 107\%$

### Interpretations

The above data is about various diversification strategies of Option Trading. There are various diversification according to investors suitability he can choose any strategy and can generate returns accordingly.

So we can use the option strategy of buying the call and put both the options in order to reduce the risk of Structured Product and to generate returns in both upside as well as downside market.

This strategy helps to generate returns through call option when the market is rising at that point the put option will become zero. Whereas when the market is falling the put option will be exercised which will generate returns and at that point call option will expire worthless.

So in this way by using this strategy we can generate returns of Structured Product in volatile market with principal protected as well as estimating adequate returns in a volatile market.

### 8. Findings

After conducting the study, analyzing the data, the researcher has found the following results;

1. Most people are less aware of Structured Products.
2. Cost for maintaining and managing portfolio of Structured product is costly with fee of 5% on ticket size.
3. Fees are sometimes hidden in the pay outs and fine print, which means an investor doesn't always know exactly how much they are paying for the product, and whether they could create it cheaper on their own



4. Structured Product is a tailored Product so its return can
5. Vary according to volatility in the market.
6. Different strategies can be applied to get returns on basis of past data. So it cannot predict the future data.
7. Structured Product will create a demand in India in coming years due to increase in volatility of market as it creates upside as well downside protection.

## 9. Suggestions

The researcher has thoroughly conducted the study and after finding out the results, the researcher is suggesting the following points to increase the impact of Structured Products in India.

1. People should be made aware of Structured Products so for that marketing should be done effectively and efficiently.
2. Banks and NBFC's should try and promote for SP's in portfolio.
3. Commission fees should be charged at minimum rate on basis of returns generated.
4. Issuers should design a structured product according to need and considering all financial factors of investor.
5. Structured Product should be designed in such a way like diversifying risk, with desired or average returns and sustainable for long term in order to attract people.

## 10. Conclusions

Structured Product the word itself says product which is Structured according to all the financial aspects of its

investors. It provides principal protection as well as generates equity like returns according to the nature of instrument. It is a tailored product design with diversifying risk and providing a place in portfolio of Investors.

Conclusion of this study is that SP can be designed accordingly to generate adequate returns with minimizing risk by using various investing strategies. However difficulty lies in creating the awareness of SP among people. Also with the commission fees charged for the SP.

So the issuers of SP's should design best suitable product satisfying the adequate needs of Investors with considering all financial aspects to create a demand for SP and also have sustainability of Structured Product in Indian Market.

## 11. Limitations

Although Structured Product is good investment instrument with principal protection with a growth in Indian market but it has some following limitations:

1. Involves Credit Risk – Never assume that just because the Bank's or NBFC's big name, the risk doesn't exist. A SP adds a layer of credit risk on top of market risk.
2. Lack of Liquidity – SP rarely trade on secondary market after issuance which means that they are highly illiquid.
3. Fees – Structured Product involves comparatively more fees involved for its maintenance called as commission fees. The fee is linked with the ticket size.

