

Automated news based ULIP fund switching model

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ULIP funds switching model recommends the fund switching in the different class of asset allocation options available based on the prediction from the news/data released. The switching tactics is based on the estimation of financial market trend from the analysing the various news/data. The model is an attempt to maximize the return on investment (ROI) in Unit Link Insurance Policies. The main advantage of ULIP over the other investment instrument is that it provides easy control and switching in various available asset allocations categories. The model predicts the future trend based on analysis result of analysis news/data released from financial market.

Keywords: Intelligent Agent, Data Mining, Expert System, ROI, Data Warehouse, Switching Tactics

Introduction:

Stock Market is the base of all equity based financial products available. Each product has its own advantages and limitations. Financial news/data are most factors which will affect the stock market. ULIP is a combination of financial products likes Insurance and Mutual Fund. The main advantage of ULIP over the other investment instrument is that it provides easy control and switching in various available categories. The categories are based on different proportion of equity and related securities, Debt, Money Market (Bond etc) and cash. The other advantage is the cheapest switching among the various categories as most of ULIP provides first 4-5 switches per year free and the additional switches can be performed at very low fixed cost irrespective the present valuation of fund. It is misconception that ULIP is not providing attractive return as equity based mutual funds because it covers Insurance too. The ULIP Switching Model has proven that ULIP can give attractive returns like mutual funds and even in long bearish trend it can give positive returns, if proper switching is performed at right time. It generates the switching recommendations by analysing the financial market at various dimensions like Indices trend, Inflation Rate, Market breath, Volatility, FII activities, AD Ratio etc with the use of financial news also. It means this model analyse the switching recommendations by analysing qualitative as well as quantitative factors which are responsible for market fluctuation. All these quantitative parameters can be determined if we analyse the huge data generated by stock market and qualitative parameters can be determined if we analyse the financial news or event information released by financial market. Applying concepts of financial econometrics, market technical and fundamentals can perform this analysis.

**The main advantage of
ULIP over the other
investment instrument is
that it provides easy control
and switching in various
available categories.**

The model has been tested with over a 5 years' time of period various ULIP data available globally and proved that ULIP can also give good appreciation on the investments even higher than the stock market.

Development of ULIP Switching Model:

Model Recommendations

The ULIP Switching Model works on analysis of financial market psychology and basic assumptions like ULIP Investments, historical trends repeat itself and financial market moves in the trend i.e. the technical analysis of stock market as well as fundamental analysis means qualitative factors also analyzed.

The major parameter covers in ULIP Switching Model are:

- Indices Trend
- AD Ratio
- Inflation Effect
- Currency Appreciation Effect
- Market Breath
- Market Turnover
- Volatility
- FII Activities
- Product Technical
- Environment Effects
- Commodity Movement etc.

$$R=f(IT, IE, CAE, MB, MT, V, FA, PT, EE, CM \dots)$$

Where,

R is recommendation and f is the function of financial market parameters as shown above.

Recommendation is derived using financial econometrics, rules, Intelligent Agents etc. The parameters required in the function are computed statistically using the different ULIP recommendation values and some of the following rules are generated for the model.

The qualitative analysis can help to measure the how technical factor will fluctuate according to financial or economical news or events. Detailed technical analysis can help in forecasting the future financial market trend by applying various basic rules like:

1. If Indices movement=Positive and Total Turnover= High in equity Then Market has a strength
2. If Index>=Moving average and Volatility = High Then Market may have the weakness in short term
3. If Indices movement < Moving Average of Indices value Then Market may have further weakness.
4. If Market Breath=Negative Then short to medium term weakness in Market
5. If FII invested figurer >= Moving average value Then Market will remain Bullish the trend in Product technical repeats in historical fashion
7. If Currency Appreciation=High
Then overall Market will be bullish
8. If Govt. Taxation rules relaxed for
Capital Gain Tax Then Market will
have the strength
:
:
:
- N. If Market =Significant down from its Top and Turnover trend is changing Then Market will bounce back

Expert system uses the backward chaining through rule-based data mining to take decisions from its knowledge base by applying rule through a state space of possibilities.

All such kind of rules is stored in set of (Fact, Production Rule) in knowledge base. It also stores the key word which repetitively used to represent the current market trend. In ULIP Switching Model we have considered make knowledge base independent from application. Expert system uses the backward chaining through rule-based data mining to take decisions from its knowledge base by applying rule through a state space of possibilities. Data Mining is based on rule induction and determines which part of knowledge base will be applied to generate recommendations.

Further Refinements:

We have used financial econometrics for designing hypotheses concerning the relationships between variables, examining the effect on financial market changes in economic conditions, ULIP investment policies and forecasting future values of financial variables.

The financial data used in ULIP Switching Model is Panel data as it has dimensions of both

Multivariate model characteristics are analyzed by simultaneous equation estimation techniques. Calculating portfolio returns conducted by first estimating the value of portfolio at each time period and then determining the returns.

Time Series Data (Data that have been collected over a period of time on one or more variables) and Cross Sectional Data (Data on one or more variables collected at a single point in time). This will also generate the key word dictionary from forecasting global financial news.

Volatility and correlation modeling and forecasting are determined by Auto Regressive Conditionally

Heteroscedastic (ARCH) and its extensions like GARCH, GARCH-M etc.

Forecasting has also included features of some standard model of stochastic (White noise, moving average, Auto Regressive and mixed Auto Regressive moving average (ARMA)).

Multivariate model characteristics are analyzed by simultaneous equation estimation techniques. Calculating portfolio returns conducted by first estimating the value of portfolio at each time period and then determining the returns. Over period of time, the various approaches to designing a database schema that is optimized for understanding and querying information have been consolidated into an approach called a dimensional model.

Recommendation Forecasting

In ULIP Switching Model, Backward chaining uses knowledge as a set of rules, rule consequents are examined to find a rule that, when executed, will achieve a goal.

Automation and Proactive Behavior

Agent technology can make ULIP Switching Model self sustainable as data mining agents function within a data warehouse structure to discover changes in business trends of potential interest, to discover new investment policies, Which one is used as best investment and other agent keeps data warehouse up to date by retrieving and filtering required data, and communicate the recommendations to intended user group.

Data Warehouse Agents can perform Communications between Data Warehouse Center servers and Financial Data Source, as new information published at source the agent is supposed to retrieve the information and update the data warehouse accordingly. When the Data Warehouse Center server is asked to complete a task that requires the use of a warehouse agent, the server finds an available port on its system and then sends a message to the warehouse. Agent must perform a handshake when communicates. Intelligent Agent system has proven its importance in Information filtering, Information Retrieval, Notifiers, Process Automation, Collaborative Customization, E-Business and OLAP applications. It enables to achieve system automation at a great extends.

Dimensional Modeling

The information in ULIP Switching Model data warehouse is organized and presented in a way that enables to formulate easily result, market query, and the answers are returned faster

than if similar queries execute in conventional transaction systems. Even ULIP Switching Model can immediately reformulate further related queries and get more details.

At the center of the dimensional model is the numeric measure that ULIP Switching Model interested in understanding, such as ULIPID, Index ID etc. Related measures are collected into fact tables that contain columns for each of the numeric measures.

There are usually many different ways that one can look at these measures. These different ways of looking at the information is called dimensions, where a dimension is a particular area of interest. Every dimension table has several columns with descriptive text. These descriptive columns are known as attributes; the more interesting attributes you can make available to users, it is considered better dimensional model.

The resulting database schema consists of one central fact table, and a number of dimension tables that can be joined to this fact table to analyze them in different ways. This design is usually known as a star schema.

Results Models Graphs and Tables:

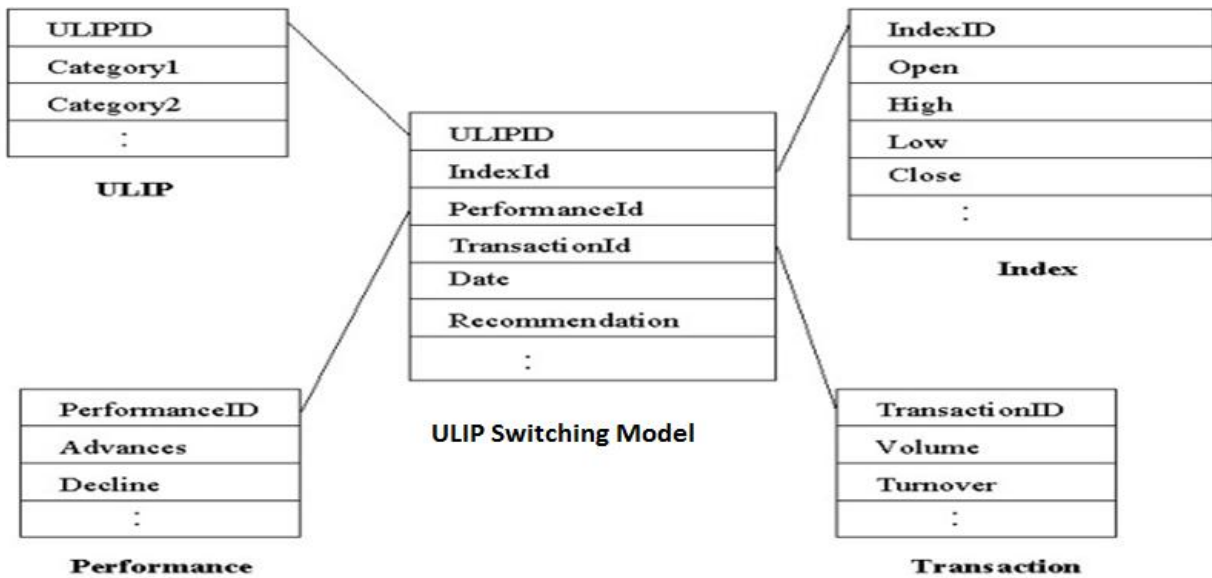


Fig: 1 Dimensional Modeling : Star Schema

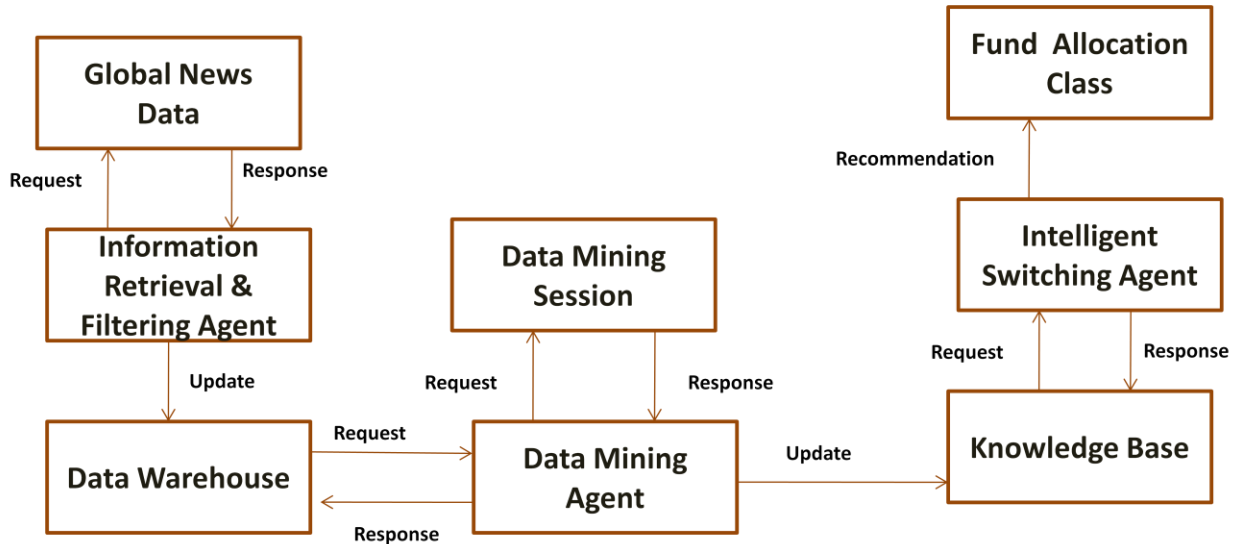


Fig: 2 An Agent based Model for ULIP Switching Recommendation

ULIP SWITCHING MODEL RESULT

Date	Preserver	Maximizer	Fund Value	Unit Preserver	Unit Maximizer
05-09-2006	11.0916	44.55	100000	0	2244.67
05-10-2006	11.0945	44.83	100628.51	0	2244.67
05-11-2006	11.0965	44.22	99259.26	0	2244.67
05-12-2006	11.0991	43.8	98316.5	0	2244.67
15-05-2006	11.1054	41.91	94074.07	0	2244.67
16-05-2006	11.1092	42.06	94410.77	8498.43	0
17-05-2006	11.1115	43.37	94430.32	8498.43	0
18-05-2006	11.1136	40.32	94448.17	8498.43	0
19-05-2006	11.1157	38.57	94466.01	8498.43	0
22-05-2006	11.1218	36.96	94517.85	8498.43	0
23-05-2006	11.1239	38.19	94535.7	8498.43	0
24-05-2006	11.126	37.35	94553.55	8498.43	0
25-05-2006	11.128	37.79	94570.54	8498.43	0
26-05-2006	11.1301	38.5	94588.39	0	2456.84
29-05-2006	11.1363	38.77	95251.74	0	2456.84
30-05-2006	11.1384	38.33	94170.73	0	2456.84
31-05-2006	11.1399	37.11	91173.38	0	2456.84
06-01-2006	11.142	35.84	88053.19	7902.82	0
06-02-2006	11.1442	37.15	88070.58	7902.82	0
06-05-2006	11.1504	36.34	88119.58	7902.82	0
06-06-2006	11.1526	35.41	88136.96	7902.82	0
06-07-2006	11.1547	34.5	88153.56	7902.82	0

21-12-2010	16.0038	72.43	232470.12	0	3209.58
22-12-2010	16.0069	72.4	232373.84	0	3209.58
23-12-2010	16.0101	72.37	232277.55	0	3209.58
24-12-2010	16.0134	72.78	233593.48	0	3209.58
27-12-2010	16.0232	72.38	232309.65	0	3209.58
28-12-2010	16.0264	72.49	232662.7	0	3209.58
29-12-2010	16.0297	73.4	235583.42	0	3209.58
30-12-2010	16.033	73.81	236899.35	0	3209.58
31-12-2010	16.0363	74.2	238151.09	0	3209.58
01-03-2011	16.0463	74.78	240012.65	0	3209.58
01-04-2011	16.0497	74.73	239852.17	0	3209.58
01-05-2011	16.0545	73.91	237220.31	0	3209.58
01-06-2011	16.0582	73.43	235679.71	0	3209.58
01-07-2011	16.0616	71.63	229902.46	0	3209.58
01-10-2011	16.0703	70.2	225312.75	0	3209.58
01-11-2011	16.0737	70.13	225088.08	0	3209.58
01-12-2011	16.0775	71.37	229067.97	0	3209.58
13-01-2011	16.081	70.48	226211.44	0	3209.58
14-01-2011	16.0844	69.23	222199.46	0	3209.58
17-01-2011	16.0947	69.16	221974.79	0	3209.58
18-01-2011	16.1	69.99	224638.74	0	3209.58
19-01-2011	16.1034	69.64	223515.39	0	3209.58
20-01-2011	16.1068	69.63	223483.29	0	3209.58
21-01-2011	16.1105	69.32	222488.32	0	3209.58

Fig: 3 Result of ULIP Switching Model Implementation

FUND VALUE APPRICIATION AS PER MODEL RECOMMENDATIONS

Product: ICICI Prudential Life Link Super					Tenure: 10-Apr-2006 To 29-Dec-2011			
Date	Life Preserver	Life Protector	Life Balancer	Life Maximizer	ULIP Recommendations	Fund Value	Unit Preserver	Unit Maximizer
05-09-2006	11.0916	14.2967	22.61	44.55	Maximizer	100000	0	2244.67
05-10-2006	11.0945	14.2988	22.67	44.83	Maximizer	100628.51	0	2244.67
05-11-2006	11.0965	14.2982	22.55	44.22	Maximizer	99259.26	0	2244.67
05-12-2006	11.0991	14.2995	22.46	43.8	Maximizer	98316.5	0	2244.67
15-05-2006	11.1054	14.3022	22.09	41.91	Maximizer	94074.07	0	2244.67
16-05-2006	11.1092	14.3062	22.12	42.06	Preserver	94410.77	8498.43	0
17-05-2006	11.1115	14.3083	22.39	43.37	Preserver	94430.32	8498.43	0
18-05-2006	11.1136	14.3052	21.79	40.32	Preserver	94448.17	8498.43	0
19-05-2006	11.1157	14.3097	21.43	38.57	Preserver	94466.01	8498.43	0
22-05-2006	11.1218	14.317	21.1	36.96	Preserver	94517.85	8498.43	0
23-05-2006	11.1239	14.3191	21.34	38.19	Preserver	94535.7	8498.43	0
24-05-2006	11.126	14.321	21.17	37.35	Preserver	94553.55	8498.43	0
25-05-2006	11.128	14.3236	21.27	37.79	Preserver	94570.54	8498.43	0
26-05-2006	11.1301	14.3258	21.4	38.5	Maximizer	94588.39	0	2456.84
29-05-2006	11.1363	14.3314	21.45	38.77	Maximizer	95251.74	0	2456.84
30-05-2006	11.1384	14.3326	21.37	38.33	Maximizer	94170.73	0	2456.84
31-05-2006	11.1399	14.3346	21.11	37.11	Maximizer	91173.38	0	2456.84
06-01-2006	11.142	14.3352	20.84	35.84	Preserver	88053.19	7902.82	0
06-02-2006	11.1442	14.3348	21.12	37.15	Preserver	88070.58	7902.82	0

Fig: 4 Result in Value appreciation by ULIP Switching Model Recommendation

Date	Fund Value	ULIP Recommendation	Result	Date	Fund Value	ULIP Recommendation	Result
05-09-2006	100000	Maximizer	Success	05-07-2009	139121.06	Maximizer	Success
05-10-2006	100628.51	Maximizer		07-07-2009	163067.79	Maximizer	Success
05-11-2006	99259.26	Maximizer	Failure	07-08-2009	159313.57	Maximizer	
05-12-2006	98316.5	Maximizer	Success	31-12-2009	192183.07	Maximizer	Success
09-12-2006	102264.53	Maximizer		14-01-2010	195494.98	Maximizer	
13-09-2006	104211.23	Maximizer	Success	04-06-2010	206301.7	Maximizer	Success
14-09-2006	104742.14	Maximizer		04-07-2010	206683.09	Maximizer	
30-11-2006	115048.3	Maximizer	Success	14-09-2010	229661.75	Maximizer	Failure
13-12-2006	111723.53	Preserver		Success	15-09-2010	231777.43	
01-02-2007	114412.54	Maximizer	Success	15-12-2010	229356.83	Maximizer	Failure
01-03-2007	114681.81	Maximizer		Success	16-12-2010	230672.76	
02-06-2007	118622.84	Maximizer	Success	17-01-2011	221974.79	Preserver	Success
02-07-2007	119479.59	Maximizer		Success	18-01-2011	224638.74	
08-09-2007	135296.01	Maximizer	Success	24-01-2011	224574.55	Maximizer	Success
09-10-2007	146590.03	Maximizer		Success	25-01-2011	223130.24	
31-12-2007	176568.58	Maximizer	Failure	05-06-2011	219054.07	Preserver	Success
01-01-2008	176082.02	Maximizer		Failure	05-09-2011	219503.41	
14-05-2008	143433.78	Preserver	Failure	05-11-2011	219631.79	Maximizer	Success
15-05-2008	143466.73	Maximizer		Failure	07-11-2011	226903.65	
31-12-2008	125977.67	Preserver	Success	18-12-2011	228508.44	Maximizer	
04-01-2009	116870.68	Maximizer		Success			
05-05-2009	138286.27	Maximizer					

Total Recommendation	21
Success	15
Failure	6
Percentage Progress	71.42%

Fig: 5 Success Rate of ULIP Switching Model

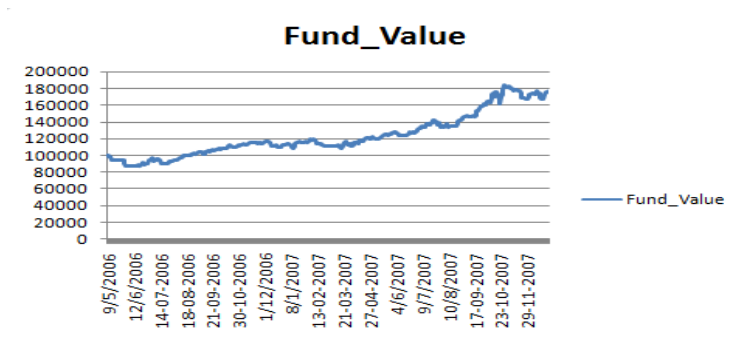


Fig 6: ULIP Switching Model Growth (2006-07)

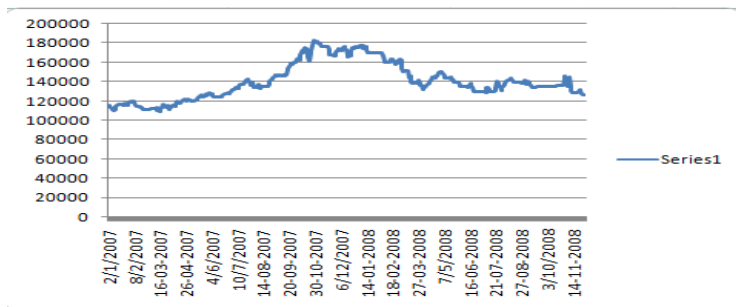


Fig 7: ULIP Switching Model Growth (2007-08)

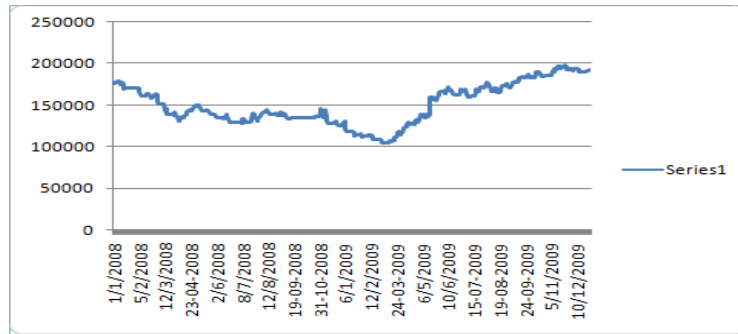


Fig 8: ULIP Switching Model Growth (2008-09)

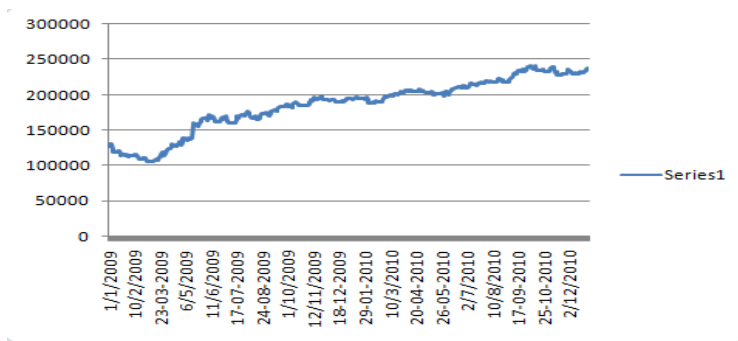


Fig 9: ULIP Switching Model Growth (2009-10)

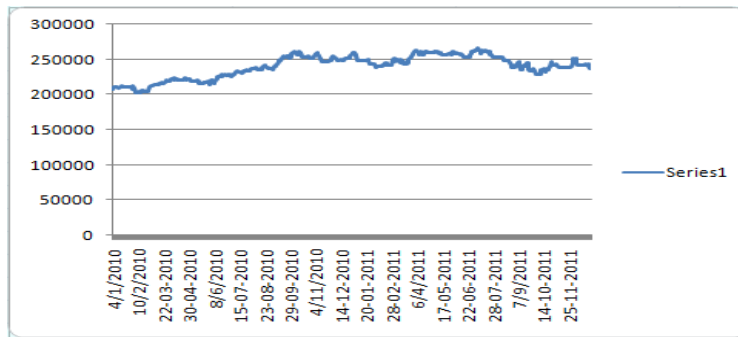


Fig 10: ULIP Switching Model Growth (2010-11)

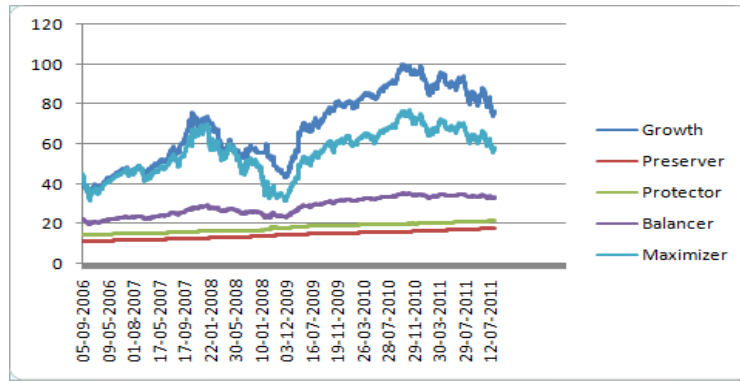


Fig 11: Comparative Return of ULIP Switching Model with other ULIP Categories

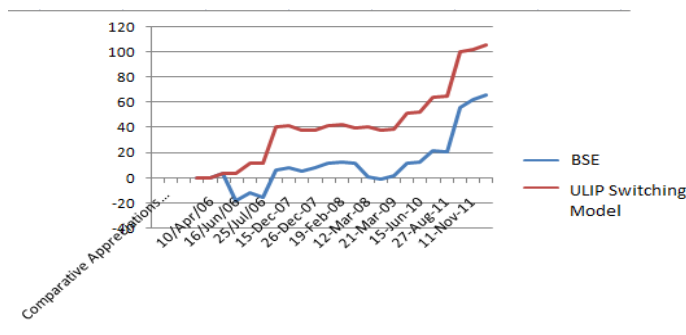


Fig 12: Comparative Return of ULIP Switching Model with BSE

Result Interpretation:

After the implementation of our model we get the results as per shown in the above graphs. Results show the profit improvement of investing the money over a period of time. Figure 2 and 3 shows the fund value movement from 2006 to 2011 by investing money in ULIP switching policy. Figure 4 shows which ULIP recommendation is best for the switching as per current statistics so investors get maximum profit and as per switching the figure 5 shows the success ratio of the model. Figure 6 to 10 shows the yearly success ratio of the ULIP Switching model. The figure 12 shows the comparison of the ULIP Switching model with the BSE. Its shows the investment profit as per the model gives more profit than investing money in BSE.

Conclusion:

Using ULIP switching Model recommendation it is proved that one get maximize the ROI by seeking financial market opportunities by automated model. ULIP switching Model performs

technical analysis as well as fundamental analysis successfully so it can be used for index future trading too.

The superiority of ULIP switching Model can be verified from the benchmark return of all ULIP categories over a 5 year period of time. The percentage return from ULIP switching Model is more than 100 %, while next highest return of BSE index is about 65% for the same tenure. Switch accuracy of ULIP switching Model is about 71.42%, which shows the strength of ULIP switching Model.

In other ULIP product also the return is almost comparable with the result has shown in paper. If financial market contains high volatility for long term and does not indicate any clear-cut trend, the amount of recommendation will increase and performance may reduce significantly.

Future Scope:

To improve existing algorithm by applying back propagation neural networks, as it can be better at handling noisy data. For the exploration of the model, include other products and make comparison among them as well as analyze the profit of investment over a period of time.

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