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Generational cohort characteristics and analysis of behavioral biases of individuals for investment decision making across inter generational Cohorts groups

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Abstract

Behavioral finance puts in perspective the implication of an individual's inherent behavior impacting decision making. The present study bases itself on the concepts of investor finance and generational studies giving much better understanding of the domain. The domain of behavioral finance has pertinently become an independent and relevant domain in finance. Generational studies expound demographic study based on generation theories, divided into cohorts, with each cohort bearing specific characteristics. The study has been carried out to comprehend the inter generational relationship of behavioral biases across generational cohorts. The study was carried in Thane with 384 individuals across generational cohorts with age ranges from 18-55 years. Statistical analysis has been carried out to analyze the relational basis. Cohort characteristic linkage has been carried out to comprehend the basis of the statistical results.

Key words Biases, Behavior, Investment, Cohort, Generation , Decision , Finance

Introduction

Individual behavior toward decision making is driven by underlying parameters of cognition and emotion. Shortcomings in traditional finance lead to developments of behavioral finance as a domain focussing individual decision making with a holistic view. Human rationality is bound by inherent behavioral traits and attitudes. Behavioral finance has encompassed elements of psychology and finance to give a deeper comprehension of human behavior in financial decision making.

Several generational cohorts coexist at a point in time. Currently, six generational cohorts Boomers, Silent Generation, Generation X, Generation Y or millennials, Generation Z and Generational alpha coexist. Each of these cohorts have shared birth ranges and experiences. The

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interlinkage between generational studies and finance is a seemingly young concept and there is a wide scope in the domain. The study tries determining the relationship between generational cohorts and their impact on behavioral biases on individuals. The tremendous work of Kahneman and Tversky and of researchers in the years that have followed have then broadened scope and vision of related fields. Behavioral issues also have then to relatively be dealt with in the real financial world while interacting with investors. Viewing the world of investors through the glasses of behavioral finance taps opaquely, areas where finance meets psychology.

Generational Theories

Generational studies have labeled the generations retrospectively. Generation based cohorts are suitably then labeled into various categories. Generations have existed since years, but with the development of psychological and behavioral studies. The boundaries between existential generations are fluid and based on the events and experiences of the era. Each pertinent generation has around twenty years in each considered cohort. Each generation shares traits and behaviors which seem to be unique to them. Generational theories initially were a study on how each generation turned and gave rise to seemingly to another. The theory has wide application in domain of population studies and acts seemingly as a mirror of the characteristics which shape and impact individual behavior.

The Mannheim theory considers the events of formative early years having a lasting effect mainly on the personna and the behavior. In every society and country there will be defining situations, events and moments that determine a specific period. Individuals born and living with shared existence experiences form a generational basis of cohort study. Karl Mannheim has defined the link between thinking process and later action taken by an individual. Rather than at just individual base level, seemingly there's a link in decisions made across cohorts.

Over time the shift in behavior and preferences becomes more obvious. The location or region where the considered person belongs demographically. W. Strauss and N. Howe have been at the forefront of generation based research. Every individual goes through numerous phases in their life, from childhood to youth, to middle old age. Each pertinent generation has around twenty years in each considered cohort. Each generation shares traits and behaviors which seem to be unique to them. Generational theories initially were a study on how each generation turned and gave rise seemingly to another. The theory has wide application in domain of population studies

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and acts seemingly a mirror of the characteristics which shape and impact inter related activities. Variations which occur in generations are a resultant of individual's personality which in turn are due to the events which impact the individual. Changes in an individuals choices and preferences are tangibly observed across varied cohorts. Although there was previous research on generations, it was W. Strauss and N. Howe who were able to bring it to forefront.

Generation X:

Generation X is categorized as the generation from early years of sixties to earlier eighties 1965-1980 is considered by the academicians and researchers to be the cohort for Generation X. This generation of India faced rapid economic changes and also faced numerous challenges.

Generation Y:

Those who are borne between that of 1981 - 1996 and include individuals Millennials are an important cohort in India due to sheer numbers in working population and resultant impact in finance investments. Inherent characteristics that categorize cohorts reflect multitudinous changes in marketplace and economy.

Generation Z:

Generation Z are the youngest age category who have entered adulthood currently for the present research. The age group have been ushered in from 1997 till year 2012 are taken as a cohort. (Pew Research).

Behavioral Biases

Cognitive biases are those biases which are derived from deviation in judgement and mental processing. These are biases which influence the manner the person thinks or behaves. The biases show the departure from normal rational behavior by person. Cognitive biases underlie the aspect that people's reaction to finance and investment isn't limited to rational step by step decisions.

Emotional bias

Emotions are a basic element underlying every individualsbehavior. People are impacted by emotional biases despite not realizing the extent of their base influence on decisions.Emotional biases were not studied in the earlier domains in finance because of stress on rationality over other aspects . With advent of behavior finance over the years, the study of emotional aspects in finance like biases have come into place.

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Review of Literature

Shefrin- Statman (2003) have studied that Kahneman with Tversky were able to give an alternative to the traditional theories. The use of cognitive backed biases and cognitive psychology were assumed to be the basis of decisions. They differed from well run, known theories that stated that people are predictable in behavior. Investors tended to avoid risk when there's a possibility of relevant gain, assets are sold at an earlier time than optimal. In contrast, investors tend bad assets for longer than optimal to precisely avoid a sure loss effect. It was also shown that gains more frequently than losses seemingly are realized.

Mitroi and Oproiu (2014) have determined that behavior based finance complements fundamental comprehending of the financial markets. Volatility impacts investor behavior and the latter could cloud the decision making process. Portfolio allocation decisions made by individuals are rooted from behavioral finance. Investors interpret financial data at a rational and an individual level. The field has combined empirical and theoretical aspects to enable a better understanding of investor behaviour.

EgidijusBikasetal (2012) have reviewed that non professional investors rely on their own perceptions and experiences rather than other factors. Study has found that pertinent investors, not rational in relevant behaviour. And investors are prone to errors. There are wide areas of research which are covered in fields, deemed of behavioral 42 finance, which have wide scope for study. Study was then conducted for investors in Lithuania.

Lissitsa, S., &Kol, O. (2016) have assessed relationship amongst, millennial Generation Y cohort X. The usage of the internet across the age groups studied. The tools were determined for assessing variation in behavior between the generations. The disposable income which they possess and the choices which they then , make are important. The digital base divide between the two generations been studied in detail . Cross sectional data has seemingly been taken for the study.

Mittendorf, C. (2018) has studied the impact of trust on the behavior of individuals. The study assessed trust factors in online services which are provided to the individuals. The people from age group of millennial category were considered and there were two hundred and fifty five relevant responses considered for study. In case of service providers, the implication of trust was factored. There's a huge implication of trust for person who seeks the information for making a decision. Analysis was carried by means of a covariance model for assessment. The adoption of

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suitable site for obtaining pertinent information is crucial. Factor analysis has been taken as a method for study. Consumption that 's been assessed in millennials, been determined in this manner.

Lowies, (2016) has found that there is an impact in behavior based biases for property market in developing markets. Many times the property based markets for these regions are highly volatile. The investment into property backed funds by the individuals been determined. The markets in real estate linked sectors are volatile in South Africa duly then changing social and economic situation. There's a probability of the person missing out on investment due to same. The paper was based on listed funds of JSE. Volatility in the environment has contributed to the issue. There's a need to understand the hitherto impact of these missed profits in the long term overall for the investors.

Research Gap

Study pertaining to behavioral biases is in the nascent stage especially relating to generational cohorts. The understanding is crucial as the implication of understanding each cohort and its characteristics forming the demographic which makes investing decisions is necessary.

Research Methodology

The research methodology includes objectives, hypotheses, area of the study, research design, and sampling method, source of data, statistical tools and tests applied have been assessed for the study. The population under study are Thane city residents and the sample has been taken across gender and generational cohorts under consideration for study. Conclusive research design was taken and stratified random sampling was used as sampling technique.

Krejcie and Morgan method was ascertained as a method of determining the sample size at 95 % confidence level and 5% margin of error as 384. The questionnaire was self-perception based to analyze the inherent behavioral inclinations of the respondents, completed responses taken for the study were 384. Suitable statistical tests like one way ANOVA and post HOC tests like Tukey Kramer were used for statistical analysis. Various parameters were taken under consideration pertaining to investment determinants.

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Table 1: Determinants considered for Inter- generational behavioral study

Behavioral Biases (Cognitive or Emotional biases)	
Emotion- Loss aversion	Aversion to loss is a bias that determines the reaction towards loss by an individual
Cognitive- Hindsight bias	Hindsight as bias involves looking at past decision taking by individuals.
Emotion- Status quo bias	Status quo is tendency to not change the current situation by individual
Emotion- Herding bias Cognitive- Conservatism bias	Herding is the tendency of one individual to follow the opinions of another Tendency to hold on to old information by an individual underlies the conservatism bias
Cognitive- Illusion of control Cognitive – Representative bias	An individual feels they can fully control a situation it's called the illusion of control Past representation, in the minds of individual leading to mental shortcuts
Cognitive- Anchoring bias	First impressions may have impact on decision taking especially a subconscious

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Emotion- Self control bias	Self control of the person reflects the manner by which the person's attitude gets impacted by their spending.
Emotion- Endowment bias	The tendency of holding on to an asset based on self perception

Research Objectives

To study the relationship of behavioral biases in investment across generational cohorts of Generation X, Generation Y and Generation Z

Hypothesis

H0: There is no significant relationship among behavioral biases in investment decision making across generational cohorts Generation X, Generation Y and Generation Z. The sub hypothesis have been taken for the study:

H01: Loss aversion in financial decision making does not have a significant relationship across generational cohorts.

H02: Hindsight bias does not have a significant relationship across generational cohorts. H03: Status quo bias does not have significant relationship across generational cohorts. H04: Herding bias do not have a significant difference across generational cohorts. H05: Conservatism bias in using information does not have a significant impact across generational cohorts

H06: Illusion of control in decision making do not have a significant relationship across generational cohorts

H07: Representative bias do not have an impact on financial decision making across generational cohorts

H08: Anchoring bias do not vary significantly across generational cohorts H09: Self control bias does not vary significantly across generational cohorts. H010: Endowment bias do not have an impact on financial decision making across generational cohorts

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Data Analysis:

Table 2: Data analysis: Determinant Parameter and result

Question	**Parameter F cal**	**F critical @0.05 Result**
How would you rate your reaction to loss in investments?	*Loss aversion* 3.4939	3.8825 Accept Null
When you think of any past decisions which gave an unfavorable return, would you want to go back and review the decision?	*Hindsight bias* 10.27	3.88 Reject Null
Once you have made investment across assets classes for your portfolio, what would you prefer?	*Status quo* 7.218	3.88522 Reject Null

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Does the majority opinion of other investors or peers influence you in decision making? Do you hold on to previously held estimates and beliefs about your investment at the expense of accepting new information?	*Herding* 2.63 *Conservatism* 3.82	3.8852 Accept Null 3.88 Accept Null
Do you believe you can control your investments future returns as per your expectations?	*Illusion of control* 3.44	3.88 Accept Null
Do your past experiences and returns influence your present decisions?	*Representative bias* 6.93	3.88 Reject Null
Can any strong review prompt you to make financial investment at first glance?	*Anchoring* 3.40	3.88 Accept Null

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How would you rate your self controlin regards to spending money?	*Self control*4.649007	4.2564 Reject Null

If you are invested in an asset you want to sell, would you hold on to it till you get your expected value despite changes in its market value? *Endowment bias* 4.7815 4.25 Reject Null

Tukey Kramer Post HOC Test

The test is a post HOC test for ANOVA, to understand the variation in paired groups. The test has been used to assess generational differences across cohort pairs where Null Hypothesis was rejected.

Table 3: Cohort pair and Q values- Tukey post HOC test

Parameter	**Cohort Pair Q calculated Q critical**	
Hindsight bias	X	Y 2.90986 3.77
	Y	Z 6.40766 df @3,12
	Z	X 3.79514
Status quo	X	Y 2.43091 3.77
	Y	Z 5.38793 df @ 3,12

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	Z	X 2.983
Representative	X	Y 2.02062 3.77
	Y	Z 5.02065 @3,12
	Z	X 2.02061
Self controlbias	X	Y 1.9582 3.95
Endowment bias	Y Z X Y	Z 4.8020 @ 3,12 X 2.3498 Y 1.9850 3.95 Z 4.3708 @3, 12
	Z	X 2.3841

Interpretation

The data from the cohorts has been analyzed for generational studies and the interpretation is based on the shared experiences with the cohort. For statistically significant results, post HOC test was carried out to assess the generational pairs which were bearing differences. Tukey Kramer test was conducted and the mean square within, MSW analyzed.

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Table 4: Parameter interpretation

Parameter	Interpretation

H1: Loss aversion in financial decision making does not have a significant relationship across generational cohorts

H2:	Hindsight bias has a significant relationship across generational cohorts
H3:	Status quo bias has a significant relationship across generational cohorts.
H4:	Herding bias do not have a significant difference across generational cohorts.
H5:	Conservatism bias in using information has a significant impact across generational cohorts.
H6:	Illusion of control in decision making does not have a significant relationship across generational cohorts.
H7:	Representative bias do not have an impact on financial decision making across generational cohorts.
H8: *H9:* *H10:*	Anchoring bias do not vary significantly across generational cohorts. Self control bias does vary significantly across generational cohorts. Endowment bias does have an impact on financial decision making across generational cohorts.

The generational pairs which had the Q calculated value greater than Q critical were taken into

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significance.

Table 5: Cohort pair parameter and post Hoc test

Parameter	**Cohort pair**	**Significance of Tukey post HOC test**
Hindsight bias	Y-Z, Z-X	When the cohort linkage was assessed for hindsight bias Q calculated value is greater than Q critical in the cohort of Generation Z and Generation X and of Generation Y and Generation Z.
Status quo bias	Y-Z	When the cohort linkage was assessed for status quo Q calculated value is greater than Q critical in the cohort of Generation Y and Generation Z.
Representative bias	Y-Z	When the cohort linkage was assessed for representative bias Q calculated value is greater than Q critical in the cohort of Generation Y and Generation Z.
Self control bias	Y-Z	When the cohort linkage was assessed for self control Q calculated value is greater than Q critical in the cohort of Generation Y and Generation Z.

Endowment bias than Q critical in the cohort of Generation Y
Y-Z When the cohort linkage was assessed for and Generation Z.
endowment bias Q calculated value is greater

Results and discussion

The results of the study are discussed based on the statistical results and cohorts characteristics and interpreting the cohort interlinkage.

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Cohort behavioral characteristic across Generations

The cohort characteristics are assessed to determine the behavioral characteristics and their linkage with the behavioral biases across generations. Behavioral categorization of cohorts enables deeper understanding of perspectives which drive decision making in individuals. Every cohort contemplates differently based on situations faced. Every cohort faces different life and societal experiences which might impact them subconsciously.

Generation X:

Gen Xers in India have witnessed several economic, cultural, demographic and technological changes. This cohort was born between 1965-1980 (Pew Research Centre). The shared experiences might be reflective of the decision making of the individuals. Xers experienced pre and post liberalized economies. They are considered digital immigrants. They have mostly grown in large or joint families. Their focus being on community, peer and self, valuing job security. Participative in interaction, Xers as a cohort are considered conservative financially with focus on financial security. They had limited opportunity compared to their successive cohorts yet having forbearance and waiting for results as a cohort.

Generation Y:

Generation Y are cohort born between 1981- 1996 facing varied challenges from the predecessor cohort. The cohort reached maturity at turn of the millennia and their shared experience differed from the predecessor cohort. The millennial cohort came of age in India as the first generation exposed to a globally integrated world. They considered digital natives fluent with the internet and technology and with smaller families than their predecessors. They are considered integrators, growing in an era of growth. Stability with flexibility matters to them as a cohort, with access to better opportunities than their predecessors.

Generation Z:

Generation Z are cohorts born between 1997 and 2012 and the research takes those individuals who have crossed eighteen years at time of study. The cohorts faced rapid changes from the intrusion of technology in every sphere. Zers are considered technoholics and a generation grown up in a global world with more emphasis on faster fulfillment of their personal and financial needs than their predecessors. The cohort has grown with smaller family sizes and being the youngest cohort have a different perspective than their predecessors.

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Table 6: Result and discussion

Parameter	**Result and Discussion**
Loss aversion	Accept Ho: Loss aversion was not different from generational cohorts. Loss is imminent while investing, but reactions towards loss varies dependent on underlying parameters.
Hindsight bias	Reject Ho: Hindsight bias has significant relationships across generational cohorts.
Status quo bias	Reject Ho: Status quo bias has significance across generational cohorts. Older cohort seems more inclined towards maintaining the status quo than successor cohorts.
Herding bias	Accept Ho: Herding bias has no significant relationship across generational cohorts.
Conservatism bias	Accept Ho: Conservatism bias has no significant relationship across generational cohorts.
Illusion of control	Accept Ho: Illusion of control has no significant relationship across generational cohorts.
Representative bias	Reject Ho: Representative bias has significance across the generational cohorts.
Anchoring bias	Accept Ho: Anchoring bias has no significant relationship across generational cohorts.

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Self control bias	Reject Ho: Self control bias has significance across generational cohorts.
Endowment bias	Reject Ho: Endowment bias has significance across generational cohorts.

Conclusion:

The research has added to the study on behavioral finance in India. The demographic, cultural and economic parameters differ across countries. The relationship among generational cohorts pertaining to the behavioral characteristics are assessed. As cohort characteristics differ across regions with variations across impacting conditions, it is vital to comprehend the scope of the study. With passing years, as newer generations get added to the existing ones and existing ones change in dominance and proportion, further research on generational cohorts should lead to better understanding of the behavior of individuals over the coming decades.

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