

**Impact of Exponential Growth Bias and Mental Budgeting on Financial Behaviors and Financial Wellbeing**

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Human beings are not rational agents as the proponents of behavioral finance claimed. Based on this premise, the current study is conducted to explore the impact of exponential growth bias and mental budgeting on the financial behaviors and financial wellbeing. By employing a mixed methodology (e.g., explanatory sequential design), on the data collected from Pakistani salaried individuals and businessmen, the results show that the exponential growth bias and mental budgeting have implications for the individuals' financial wellbeing. Also, it is found that financial behaviors mediate the relationship between behavioral biases and financial wellbeing. The study recommends enhancing the awareness of the financial decision-makers concerning the exponential effect of interest rates. It also recommends employing more officious ways of budgeting by individual decision-makers, instead of just maintaining mental accounts of savings, investments and spending.

**Keywords:** Behavioral Finance, Exponential Growth Bias, Mental Budgeting, Financial Behaviors, Financial Wellbeing

**INTRODUCTION**

Proponents of behavioral finance claims that human beings do not exhibit rationality while making financial decisions. This claim questions the validity of traditional rationality based finance theories i.e. Utility Maximization Theory of Neumann & Morgenstern (1944), Portfolio Theory of Markowitz (1952) and Efficient Market Hypothesis of Fama (1970). In this context, significant interventions are made by the psychologists in the field of finance from 1970s onward. Prominent work is presented by Tversky & Kahneman (1971), Kahneman & Tversky (1979), Tversky & Kahneman (1974), DeBondt & Thaler (1985), Thaler (1990), Jagadeesh & Titman (1993), Thaler (1985), Mehra & Prescott (1985), Benartzi & Thaler (1995), Chan, et al. (1996), Camerer & Lovallo (1999), Rabin (1998), Thaler (1999), Shefrin (2000), Barber & Odean (2001), Shiller (2003), Grinblatt & Keloharju (2009), Stango & Zinman (2009), Glaser & Weber (2007), Bernéus, et al. (2008), Antonides, Groot, & Raaij (2011), Almenberg & Gerdes (2012), Statman (2014) and Foltice & Langer (2018). These researchers raise questions against the rationality. Acknowledging the research in the field of behavioral finance, it is now commonly believed that human beings exhibit irrational behavior; they use heuristics (mental shortcuts) while making financial decisions.

While, financial wellbeing is a vastly recognized concept in recent academic literature. It refers to as the outcome of financial decisions (Baker & Ricciardi, 2014) and a state-of-being, in which individuals can entirely fulfill their present and future financial obligations (Consumer Financial Protection Bureau, 2017). Also, it is explained as a state in which individuals feel that their financial future is secured, and they can make such choices through which they can enjoy their life (Consumer Financial Protection Bureau, 2017). Factors like retirement planning (Lusardi & Mitchell, 2006), financial management (Lusardi & Mitchell, 2007), financial behaviors (Gutter & Copur, 2011), financial satisfaction (Ali, Rahman, & Bakar, 2015) and debt

dealing ability (Tsai, Dwyer, & Tsay, 2016) affect the financial wellbeing of the individuals.

Financial decisions based on irrational behaviors and heuristics disallow individuals to achieve higher level of financial wellbeing, where least understanding of financial concepts further amplify the adversity (CERME - Ca'Foscari University of Venice, 2016). Individuals with least understanding of compound interest could failed to do effective financial planning. They tend to estimate compound interest by anchoring on simple interest and by adjusting it insufficiently upward. This could lead to precision errors in estimating future value. These errors occur, if the rate of interest is high or if the time period is long because compound interest has an exponential effect (Eisenstein & Hoch, 2007). Stango & Zinman (2009) termed the underestimation of the exponential effect of interest rate on a given investment as exponential growth bias. Another factor, misleads the individuals, is the tendency to manage finances by categorizing separately into various mental accounts; referred to as mental budgeting (Thaler, 1999), results in under or overspending (Antonides, Groot, & Raaij, 2011), which could implicate the financial wellbeing of the individuals (Baker & Ricciardi, 2014).

Also, individuals exhibit both positive and negative financial behaviors (Allgood & Walstad, 2016), determined by their personality traits, emotions and mental mistakes (Baker & Ricciardi, 2014). High borrowings and lower savings are attributed to exponential growth bias, as individuals affected by this bias underestimate the future value and interest rate on a given investment or spending (Stango & Zinman, 2009). Whereas, individuals maintaining mental budgets exercise healthy financial behaviors, as they could be financially more aware of the consequences and care about a specific investment or spending (Groot & Raaij, 2016). Exercising financial behaviors such as planning a budget, saving for future, availing credit through risky credit cards and compulsive buying significantly affect the individual's overall financial wellbeing (Gutter & Copur, 2011).

Although, a plenty of literature is available in various contexts highlighting the evidence of irrationality and its consequences on financial wellbeing. However, limited research is carried out to investigate the implications of exponential growth bias, mental budgeting and financial wellbeing in the context of developed countries e.g. Stango & Zinman (2009), Antonides et al. (2011), Almenberg & Gerdes (2012), Foltice & Langer (2018) and Levy & Tasoff (2017). Seeking evidence from a developing country e.g. Pakistan regarding the implications of exponential growth bias and mental budgeting for financial behaviors and financial wellbeing could not only strengthen the existing body of knowledge, but will also provide valuable insights to understand the financial wellbeing issues of the individuals in Pakistan. With this background, current study aims to explore the evidence and implications of exponential growth bias and mental budgeting on the individuals' financial behaviors and financial wellbeing in Pakistan.

The upcoming section reviews the related literature and develops the hypotheses. Afterwards, methodology is devised, analysis of results is made, and conclusions are drawn.

## LITERATURE REVIEW AND HYPOTHESIS

### Exponential Growth Bias, Financial Behaviors and Financial Wellbeing

According to Eisenstein & Hoch (2007), individuals tend to estimate compound interest by anchoring on simple interest and by adjusting it insufficiently upward. This could lead to precision errors while estimating the future value. These errors occur, if the rate of interest is high or if the time period is long because compound interest has an exponential effect. Stango and Zinman (2009) named this phenomenon as exponential growth bias. It is "the pervasive tendency to linearize exponential functions when assessing them intuitively" (Stango & Zinman, 2009, p. 2808). Two stylized facts are found by Stango and Zinman (2009) about this bias. The first one is that the individuals underestimate the interest rate assuming that other loan terms are given. Secondly, they underestimate the future value of an investment under certain terms. Due to these stylized facts, individuals exhibit high borrowings, less savings and indulge in shorter maturities (Eisenstein & Hoch, 2007).

Soll, Keeney, & Larrick (2013), support the findings of Eisenstein & Hoch (2007) and Stango and Zinman (2009), by arguing that individuals underestimate the time period required to pay off a debt when its payment just covers the interest rate. They also found that individuals having lower numeracy levels underestimate the monthly installment of a debt payable in three years' time period. On the other hand, individuals having a higher level of numeracy overestimate the amount of such monthly installments. Such, under and overestimation affect the financial wellbeing of individuals.

Moreover, exponential growth bias affects the savings and investment decisions. In an experimental study conducted by McKenzie & Liersch (2011) on employees and college students in the USA, the systematic underestimation of exponential growth in the context of savings for retirement is found. Moreover, Goda, Manchester, & Sojourner (2014) in a study regarding pension decisions opined that individuals underestimate the impact of

exponential growth, resultantly; their view of intertemporal budget constraints becomes distorted and consequently, they make sub-optimal saving decisions. Foltice & Langer (2018) also supported empirically the findings of McKenzie & Liersch (2011) and Goda, Manchester, & Sojourner (2014). They found the impact of exponential growth bias on both savings and debt decisions. Possible reasons for exhibiting exponential growth bias could be overconfidence, as evidenced by Levy & Tasoff (2016) and Tasoff (2017) in lab experiments where they found people exhibiting overconfidence when they were asked to work out exponential growth on the investment.

Exponential growth bias is also linked with financial literacy. Almenberg & Gerdes (2012) found a negative correlation between exponential growth bias and financial literacy. They recommended to adequately controlling financial literacy as a variable, to avoid biased relation between exponential growth bias and household financial decisions. However, effective debiasing of exponential growth bias can be carried out by formal formula learning of compounding interest, as suggested by Foltice & Langer (2017).

From the above literature, the current study finds that individuals underestimate the exponential growth of interest rate overtime (Stango & Zinman, 2009). The underestimation of interest rate affects the financial behaviors such as investing, savings (Foltice & Langer, 2018) and spending (Eisenstein & Hoch, 2007). The underestimation of interest rate on a saving or investment also affects the financial wellbeing. As the individuals affected by exponential growth bias will be more inclined towards borrowing more and saving / investing less and they will be more interested in short term maturities (Almenberg & Gerdes, 2012; Levy & Tasoff, 2016). Therefore, following hypothesis are developed:

*H<sub>1</sub>: The existence of exponential growth bias affects the financial behaviors of the individuals negatively.*

*H<sub>2</sub>: The existence of exponential growth bias affects the financial well-being of the individuals negatively.*

### Mental Budgeting, Financial Behaviors and Financial Wellbeing

Mental budgeting is defined as a phenomenon in which "money is labeled for particular spending or saving categories, and the budgets reserved for expenditure or saving are considered as binding" (Antonides, Groot, & Raaij, 2011, p. 547). Mental budgeting, as a distinct phenomenon, emerged from the concept of mental accounting first introduced by Thaler (1985). The laureate, while explaining various dimensions of the Prospect Theory of Kahneman & Tversky (1979), found that financial behaviors are explained by mental accounting and mental accounting leads the individuals to deviate from the traditional economic theory. Moreover, mental budgeting affects the decision-making process, as it is related to the perception of events, their categorization and assignment to particular events (Groot & Raaij, 2016).

Taking into view another perspective, mental budgeting is a psychological separation of various economic categories such as keeping a weekly budget of food spending separate from that of the weekly budget of entertainment spending Health & Soll

(1996). When the mental accounts are categorized based on the spending or saving of the money, it is referred to as mental budgeting. Categorizing money based on such mental accounts is contrary to the money fungibility assumption (Thaler, 1990). As it has been observed that mental budgeting could lead to under and overspending behavior (Antonides, Groot, & Raaij, 2011), it could result in healthy financial behaviors by increasing awareness and carefulness of consequences (Groot & Raaij, 2016) and could also affect the overall financial wellbeing (Baker & Ricciardi, 2014), therefore; following hypothesis are developed:

**H<sub>3</sub>:** *Exercising mental budgeting affects the financial behaviors of individuals positively.*

**H<sub>4</sub>:** *Exercising mental budgeting affects the financial well-being of individuals positively.*

#### **Mediating Role of Financial Behaviors**

Financial behaviors such as planning a budget, obsessive buying, availing credit at high-interest rates through credit cards and savings for the future significantly define the individuals' financial wellbeing (Gutter & Copur, 2011). Moreover, the way of managing investments and long-term loans also implicate the financial wellbeing (Brown & Gray, 2016). For instance, the investment itself is healthy financial behaviour. Those who do not invest would miss healthy financial behaviour. Another significant investment behaviour would be that individuals if investing, could be investing in more than one security. This could give the diverse exposure (Allgood & Walstad, 2016). Such financial behaviours could help individuals to smooth their financial wellbeing.

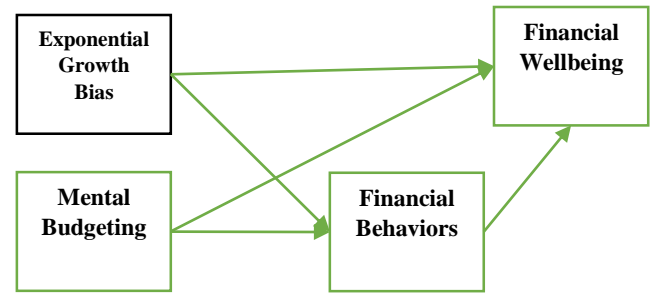
In previous sections of the literature review, links between the impact of behavioural biases e.g. exponential growth bias and mental budgeting have been hypothesized with the financial behaviours of the individuals. Moreover, in the preceding para, an impact of financial behaviours on financial wellbeing is also evident. Therefore, a mediating role of financial behaviours between the relationship of behavioural biases and financial wellbeing can be established. Accordingly, the following hypotheses are proposed to be tested in this study.

**P<sub>1</sub>:** *The existence of exponential growth bias affects the financial behaviors of the individuals negatively, which in turn affects the financial well-being of the individuals negatively.*

**P<sub>2</sub>:** *Exercising mental budgeting affects the financial behaviors of the individuals positively, which in turn affects the financial well-being of the individuals positively.*

#### **Theoretical Framework**

Based on the review of related literature and the development of the hypothesis, the theoretical framework of the study is presented in Figure 1.



**Figure 1:** Theoretical Framework

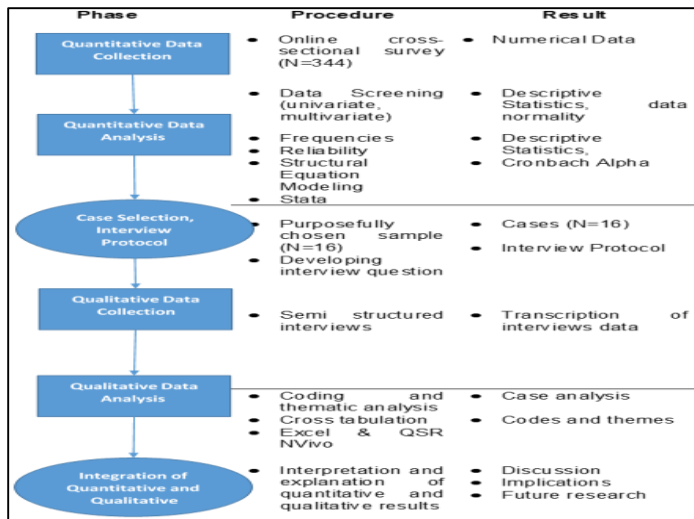
#### **METHODOLOGY**

Following Creswell (2015), a mixed-methods are employed i.e. explanatory sequential design is followed in which quantitative analysis followed by a qualitative analysis is carried out (Figure 2).

#### **Quantitative Phase**

To carry out the quantitative analysis, a survey questionnaire was prepared to collect the quantitative data regarding the variables of interest. The items of the questionnaire adopted from various studies were deliberated with experts to make sure face validity. Necessary changes in the questionnaire items were also made, keeping in view the local settings. Few questions were phrased in a negative manner to avoid inattentive replies. Moreover, before the actual collection of data, the survey questionnaire was disseminated for pilot testing. 80 responses collected in piloting phase were checked to ensure internal consistency by applying Cronbach Alpha test.

The respondents were the employees and businessmen of Pakistan and response of only those employees and businessmen were considered who were job or business experience of more than three years. This criterion was followed as such individuals normally make day to day financial decisions regarding investments, spending, borrowings and savings. Employing a convenient sampling technique, 1,061 individuals were approached, in line with the recommendations of OECD (2015). Out of 1,061 individuals contacted, 611 responded to the survey questionnaire. As per the criterion devised, only those respondents were selected in the final sample who had more than three years of job or business experience, thus making the final sample of 344 respondents. A response rate of 56.30% was recorded which was considered adequate for analysis being above 50%, as suggested by Rubin & Babbie (2010). Moreover, the sample size was within the range of 200-400, suitable for social sciences research (Hair, Sarstedt, Ringle, & Mena, 2012).



**Figure 2:** Research Design

The survey questionnaire includes nine questions related to demographic information of the respondents. Two questions were about the presence of exponential growth bias in the respondents. These question items were adopted from the studies of Almenberg & Gerdes (2012) and Foltice & Langer (2018). Whereas mental budgeting is measured through a 7-point Likert scale (*where 1 means extremely disagree and 7 means extremely agree*) comprise of four items It was adopted from the study of Antonides, et al. (2011). A higher mental budgeting score referred to the presence of a higher level of mental budgeting and vice versa. Regarding financial behaviors, four questions adapted from Allgood & Walstad (2016) were asked to ascertain whether individuals were involved in positive or negative financial behaviors. Financial behaviors were transformed in a way to reflect negative financial behaviors. To ascertain the level of the financial wellbeing of the individuals, ten questions, adopted from the study of CPF-B-USA (2017), were asked.

For the sake of empirical analysis, data collected through a survey questionnaire was quantified into meaningful numbers by employing data transformation. Statistical tools e.g. descriptive statistics, reliability statistics, correlation analysis, multicollinearity diagnostic are carried out, before testing of hypothesis. Hypotheses are tested by employing Structural Equation Modeling in Stata. Sample statistics are presented in Table 1.

**Table 1: Sample Statistics**

Variable	Description	Percentage / mean (SD)
Profession	Job	86.92%
	Business	13.08%
Experience (years)	3-5	30.52%
	5-10	31.10%
	>10	38.37%
Gender	Male	84.01%
	Female	15.99%
Age Group (years)	18-24	8.72%
	25-34	52.03%
	35-44	23.55%
	45-54	11.05%
	55-64	4.65%
Education (years)	05	0.29%
	08	0.58%
	10	0.87%
	12	3.78%
	14	27.33%
	16	36.34%
	18	28.78%

	21	2.03%
Monthly Income (PKR)	25,000	11.34%
	37,500	31.98%
	75,000	35.17%
	100,000	21.51%
Marital Status	Divorced / Separated	0.87%
	Married	69.48%
	Single	29.65%
Exponential Growth Bias	No	38.66%
	Yes	61.34%
Mental Budgeting Score		4.69 (1.32)
Financial Behavior Score		3.42 (1.06)
Financial Wellbeing Score		20.95 (5.02)

Cronbach Alpha statistics, as presented in Table 2 shows that the data collected through the research instrument is reliable for testing the hypothesis.

**Table 2: Cronbach Alpha Statistics**

Variables	Construct	Items in the scale	Reliability coefficient
All	All	20	0.7685
IV	Exponential Growth Bias and Mental Budgeting	06	0.7722
DV	Financial wellbeing	10	0.6895
MedV	Financial behaviors	04	0.7789

Correlation analysis suggested that exponential growth bias and mental budgeting have a weak negative correlation with financial behaviors. On the other hand, exponential growth bias has shown a weak but positive correlation with financial wellbeing, whereas mental budgeting has shown a weak negative correlation with financial wellbeing. To ensure that there exist no multicollinearity issues in the data, Variance Inflation Factor (VIF) Statistics are employed. The severity of multicollinearity was ignored as the values of VIF statistics were well below the threshold value of 4.

### Qualitative Phase

Based on the results of the quantitative phase, various interrelationships were identified, which have provided the basis for the qualitative analysis. An in-depth investigation of the relationships, identified through quantitative analysis, was carried out through semi-structured interviews. The interviews were conducted with the same participants who participated in the survey questionnaire, in line with the recommendations of Creswell (2015), except for three interviewees. These three participants were interviewed, being university professors, having Ph.D. and MS degrees. For ensuring high-quality response, as the interview questionnaire prepared was more of technical nature, only those participants were interviewed who were specialized in the field of management sciences. This way the researchers became able to verify and explain further the relationships identified through quantitative analysis. Semi-structured interviews are considered as a highly validated tool, as it enabled the researcher to discuss the research issue in detail with the interviewees (Galletta, 2013; Glesne, 2015).

In line with Creswell (2015) and Saunders, et al. (2018), twenty interviews were planned, but the interview sessions were terminated at 16<sup>th</sup> interview, as the researchers felt that no new point was being raised by the participants and a saturation level was reached. The data collected through interviews in the qualitative phase were voice recorded. Based on the recordings, transcripts of each interview were prepared and analyzed in NVivo software. A thematic analysis was carried out, after creating cases and coding against the nodes. Attribute analysis was also carried out to summarize the background of each participant. Findings of both the phases e.g. quantitative and

qualitative were integrated to reach the overall findings of the study.

## FINDINGS AND DISCUSSION

### Quantitative Phase

Table 3 presents the results of quantitative analysis. The hypotheses proposed in the previous section are tested through Structural Equation Modeling by estimating 50 bootstrap replications. Hypothesis 1 is accepted, which shows that exponential growth bias negatively affects the negative financial behaviors significantly. This shows that individuals exhibiting exponential growth bias are less likely to undertake negative financial behaviors. Profession and education (two control variables) show a negative effect on negative financial behaviors, thereby meaning that employees are more likely to involve in negative financial behaviors than the businessmen. Moreover, individuals with higher level of education are less likely to exercise negative financial behaviors. Hypothesis 2 is not accepted, which shows that exponential growth does not affect financial wellbeing. However, a control variable e.g. monthly income has shown a strong positive impact on the financial wellbeing of the individuals, which shows that individuals having higher monthly income enjoy a higher level of financial wellbeing. Hypothesis 3 is also accepted, which shows that mental budgeting significantly affects the negative financial behaviors negatively. Thereby, meaning that individuals exercising higher level of mental budgeting are less likely to involve in negative financial behaviors. Moreover, profession and education (two control variables) show a significant negative impact on negative financial behaviors, as found previously during testing of Hypothesis 1. The results of the model run for testing Hypothesis 4 do not support the hypothesis that mental budgeting affects the financial wellbeing of the individuals positively. However, in this case, monthly income has again shown a significant positive relationship with the financial wellbeing of individuals.

**Table 3: Results of Quantitative Phase**

Variable	Financial Behavior s (H <sub>1</sub> )	Financial Wellbeing g (H <sub>2</sub> )	Financial Behavior s (H <sub>3</sub> )	Financial Wellbeing g (H <sub>4</sub> )	Financial Behavior s as Mediator (P <sub>1</sub> )	Financial Behavior s as Mediator (P <sub>2</sub> )
Profession	0.362 (0.171) *	0.087 (0.933)	0.392 (0.191) *	0.142 (0.832)	0.361 (0.182) *	0.391 (0.178) *
Experience	0.020 (0.027)	-0.127 (0.152)	0.021 (0.035)	-0.125 (0.161)	0.020 (0.033)	0.025 (0.029)
Gender	0.152 (0.149)	0.088 (0.059)	0.125 (0.173)	1.194 (0.938)	0.151 (0.144)	0.125 (0.154)
Age Group	-0.005 (0.008)	-0.017 (0.038)	-0.002 (0.008)	-0.016 (0.035)	-0.005 (0.008)	-0.003 (0.008)
Education	-0.076 (0.025) **	-0.002 (0.125)	-0.065 (0.031) *	-0.034 (0.104)	-0.075 (0.030) *	-0.065 (0.025) **
Field of Study	-0.093 (0.161)	-0.199 (0.821)	-0.079 (0.145)	-0.287 (0.626)	-0.093 (0.139)	-0.079 (0.163)
Monthly Income	-0.000 (0.000)	0.000 (0.000) ***	-0.000 (0.000)	0.000 (0.000) ***	-0.000 (0.000)	-0.000 (0.000)
Marital Status	0.087 (0.168)	-0.795 (0.719)	0.046 (0.166)	-0.806 (0.762)	0.087 (0.179)	0.046 (0.035)
Exponential Growth Bias	-0.246 (0.124) *	0.519 (0.541)	-	-	-0.245 (0.124) *	-
Mental Budgeting	-	-	-0.069 (0.034) *	-0.209 (0.203)	-	-0.069 (0.035) *
Financial Behavior Score	-	-	-	-	-0.539 (0.248) *	-0.539 (0.177) **
Constant	4.559 (0.496) ***	19.128 (2.292) ***	4.578 (0.599) ***	20.909 (2.241) ***	4.559 (0.497) ***	4.578 (0.533) ***

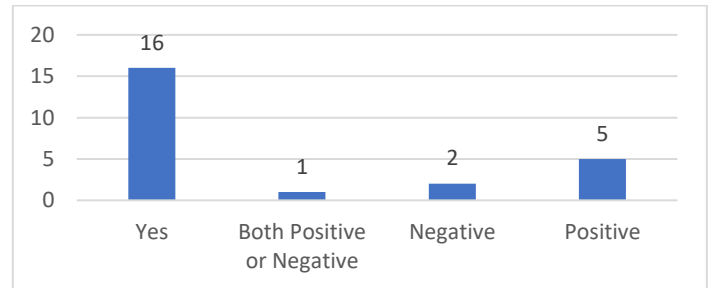
					<sup>b</sup> 22.794 (0.937) ***	<sup>b</sup> 22.794 (0.628) ***
Overall Goodness of Fit (P>Chi)	0.000	0.000	0.000	0.000	0.021	0.015
Number of Observation	344	344	344	344	344	344

s  
\* P < 0.05  
\*\* P < 0.01  
\*\*\* P < 0.001  
<sup>a</sup> constant value of independent variables and mediator  
<sup>b</sup> constant value of mediator and dependent variable

The mediating role of financial behaviors between the relationship of exponential growth bias and mental budgeting with financial wellbeing is found significant as tested in Proposition 1 and Proposition 2. Significant results of Proposition 1 show that exponential growth bias negatively affects the negative financial behaviors which in turn affect the financial wellbeing negatively. To be more specific, it shows that individuals exhibiting exponential growth bias are less likely to exercise negative financial behaviors, where negative financial behaviors have a significant effect on the financial wellbeing.

### Qualitative Phase

The results of the quantitative phase are further deliberated with experts through interviews. Regarding the effect of exponential growth bias on financial behaviors, the experts were asked a question that “Do you think that underestimating future value (exponential growth bias) can affect the financial behaviors?” Although, the respondents were agreed with the statement, however; they have shown differing views regarding the direction of the relationship among both the variables, as shown in Figure 3.



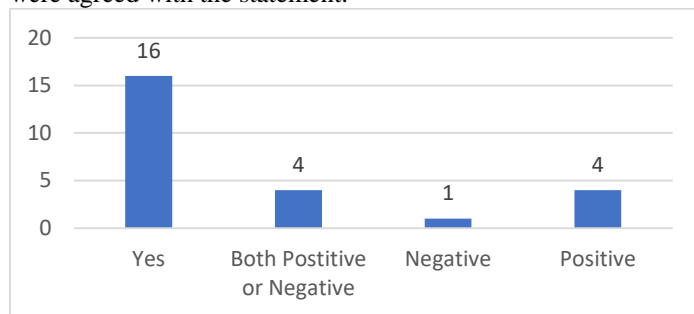
**Figure 3: Exponential Growth Bias and Financial Behaviors**

For instance, interviewee 6, arguing in favor of both positive and negative impact, said that “one aspect could be if someone is underestimating, he would be less likely to invest. Because for him return will be very low. This relationship could be positive if people are underestimating the future value for some certain risky investments, and they avoided those”. Whereas, Interviewee 4, supporting the negative impact of exponential growth bias on financial behaviors, claimed that “If people are not exactly known about the growth of future investment, it will negatively affect their investment behaviors”. However, most of the interviewees supported the positive impact of exponential growth bias on financial behaviors. For instance, Interviewee 3 argued that “If I will see future is not giving good return, I might not go with that investment. Risk aversion could be a factor for underestimating the future value regarding an investment which will affect the investment behaviors positively”. Moreover, Interviewee 9 also supported the positive impact in these words, “people behave



conservatively, and they set their targets at a low level so that they could achieve the expected future returns easily. And if there are any losses, then these losses are not too high comparing the threshold". Another important explanation of the positive impact of exponential growth bias on financial behaviors was given by Interviewee 7, who argued that "by underestimating, people try to be more secure. Considering future security, they will invest more". From the arguments given by experts, the overall agreement was found that exponential growth bias does affect the financial behaviors. However, with regards to the direction of the relationship, the argument of Interviewee 9 found logical that people behave conservatively resultantly, they set their financial targets at the lower level to ensure getting expected future returns conveniently.

Concerning the significant impact of mental budgeting on financial behaviors, the interviewees were asked "Do you think Mental Budgeting can affect the Financial Behaviors?". The results, as presented in Figure 4 show that all the 16 interviewees were agreed with the statement.



**Figure 4:** Mental Budgeting and Financial Behaviors

However, a difference of opinion was recorded with regards to the direction of the relationship. For instance, Interviewee 13, while explaining that mental budgeting can affect the financial behaviors in both positive and negative ways, claimed that "this relationship could be positive or negative depending on how we do mental budgeting". While, Interviewee 1 argued that "If a person planned to invest and he created a mental account by allocating a future cash inflow to be utilized for a specific investment, this could result in a positive effect on investment behavior of that individual". On the other hand, Interviewee 6 provided a strong point in favor of positive impact of mental budgeting on financial behaviors, claiming that "Mental budgeting could affect positively the investment behaviors. One of the benefits is heuristics, in a way that makes life easier. It is a kind of nudging. You are maintaining separate accounts". The argument given by Interviewee 7 was also logical, as he said "Positive relation could be seen as people are more vigilant, balanced and more aware of their spending and savings patterns".

From the analysis of the viewpoint of the interviewees, it has been found that mental budgeting can act as a barrier or can play a positive role in explaining the financial behaviors of the individuals. It can help the individuals in balancing their spending, investment and saving behaviors.

As far as the mediating role of financial behaviors between the exponential growth bias and financial wellbeing is concerned, the interviewees were asked that "Do you think that underestimating

future value (Exponential Growth Bias) can affect the Financial Behaviors, which can further affect the financial wellbeing?". All the respondents have shown agreement with the statement. The mediating role of financial behaviors between the relationship of mental budgeting and financial wellbeing is also endorsed by the interviewees. Moreover, the relationships of control variables with financial behaviors and financial wellbeing e.g. profession, education and monthly income, as found in quantitative analysis, were also supported by the interviewees.

The results of the quantitative and qualitative analyses were integrated further by employing a comparative statement and based on the findings of both the phases, overall findings of the research are made. Integrated results show that individuals exhibit exponential growth bias are less likely to involve in negative financial behaviors. These results are contrary to hypothesis 1 that the existence of exponential growth bias affects the financial behaviors negatively and also contrary to the findings of Stango and Zinman (2009). The qualitative analysis helped in understanding this contrariness by finding that possibly it is due to the reasons that they behave conservatively and set their targets at a low level to achieve the expected future returns easily. They ensure that if they face losses, those should be minimum. It is also found that financial behaviors depend upon what people do; those who do the job would have different behavior than those who do business. This finding is in line with the Allgood & Walstad (2016), as they found that financial behaviors depend upon the occupation. The finding that higher education results in healthy financial behavior are also in support of literature e.g. Mak & Ip (2017). While testing the link between exponential growth and mental budgeting with financial wellbeing, it was found that monthly income has a significant positive impact on financial wellbeing. This supports the findings of Zyphur, Li, Zhang, Arvey, & Barsky (2015) and Brown & Gray (2016).

Mental budgeting could result in exercising both positive and negative financial behaviors. A positive relationship is in line with the proposed hypothesis and also supports the viewpoint of Groot & Raaij (2016), who found that mental budgeting increases awareness of consequences and results in healthy financial behaviors. The negative impact of mental budgeting could be due to the restricted ability of understanding and information absorbability. The mediating role of financial behaviors between behavioral biases e.g. exponential growth bias and mental budgeting and financial wellbeing is a phenomenon that is not studied before, therefore, it is a value addition to the existing body of knowledge.

## CONCLUSION

The study was aimed to explore the evidence and implications of exponential growth bias and mental budgeting on the financial behaviors and financial wellbeing of the individuals. Based on a holistic review of existing literature, it was found that although, plenty of literature is available in various contexts highlighting the evidence of irrationality and its consequences on financial decisions, however; limited research is carried out to investigate the implications of exponential growth bias and mental budgeting on financial behaviors and financial wellbeing and that too in the context of developed countries e.g. Stango & Zinman (2009),

Antonides et al. (2011), Almenberg & Gerdes (2012), Foltice & Langer (2018) and Levy & Tasoff (2017). The gap in existing literature motivated the researchers to seek evidence from a developing country e.g. Pakistan regarding the implications of exponential growth bias and mental budgeting towards financial behaviors and financial wellbeing. It has the motivation to strengthen the existing body of knowledge and to provide valuable insights to understand the financial wellbeing issues of the individuals from Pakistan. With this aim, an extensive mixed methodology was adopted e.g. explanatory sequential design, in which firstly, a quantitative analysis was carried out on the data collected from job and business holders from Pakistan. Based on the findings of quantitative analysis, a qualitative analysis was carried out to further explain the findings.

The findings of the study emerged through the quantitative and qualitative analysis provide strong evidence from Pakistan that exponential growth bias and mental budgeting have implications towards financial behaviors and the financial wellbeing of the individuals. Although exponential growth bias is found to have a positive impact on financial behaviors, which is contrary to theory, the qualitative analysis has provided its justification that such individuals could behave conservatively and set their targets at a low level to achieve the expected future returns easily. The significant mediating role of financial behaviors between behavioral biases and financial wellbeing is an important finding of this study.

Based on the findings of the study, it is recommended that awareness of financial decision-makers, both at the individual level and organization level, regarding the exponential effect of interest, is required to be enhanced, to enable them to make their financial decisions more rationally. It is also recommended that although mental budgeting is found to have a significant positive relation with financial behaviors, individuals have to be more conscious and to exercise routine reviews of their budgets by using more officious ways such as writing down budgetary allocations and tracking spending accordingly, instead to just do mental budgeting.

This study has not taken into account the financial literacy levels of the individuals who make their day to day financial decisions. It is recommended that future studies should study the role of financial literacy to further investigate the interrelationships of behavioral biases, financial behaviors and financial wellbeing.

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