Effect of Heuristic Biases on Capital Structure of Firms listed at Nairobi Securities exchange, Kenya.

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Abstract

The study sought to find out the effect of heuristic biases on capital structure of firms listed at Nairobi Securities Exchange, Kenya. The study used firm size, profitability, tangibility and growth opportunities as control variables. Regression analysis revealed the following: 59.8% of capital structure could be explained using heuristic bias, firm size, profitability, and tangibility and growth opportunities. The regression coefficient showed that heuristic biases had a negative and significant effect on capital structure (β = -2.814, p < 0.05). Firm size had a negative and significant effect on capital structure (β =-0.413, p<0.05). Tangibility had a positive and significant effect on capital structure (β =3.962, p<0.05). However, growth opportunities and profitability had a positive and insignificant effect on capital structure. The F-test depicted that the model was significant (p<0.05) in explaining changes in capital structure. The study concluded that capital structure of firms is affected by irrational behavior of the managers.

Keywords: Heuristics, capital structure, firm size, profitability, tangibility, growth opportunities.

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1. Introduction

Heuristics are rules of thumb. They simplify decision making process by substituting a difficult question with an easier one (Kahneman, 2011). Heuristic bias can be a source of cognitive biases. According to Huang and Liu (2007), heuristics can be a good source of faster decision making while at the same time they can lead to systematic errors. Tversky and Kahneman(1974) identified three heuristics as representative bias, availability bias, anchoring and adjustment. Practically it is not possible to have a decision maker who is capable of processing all relevant information and come up with a choice under limited time and constrained conditions. The need to ease processing information leads to heuristics or shortcuts (Riyazahmed & Saravanaraj, 2016).

There are many studies which indicate that people cannot be relied upon to make accurate probability assessments in many contexts. One such explanation is the use of heuristics (Tversky & Kahneman, 1973, 1974). In a world where knowledge is limited coupled with time and resource constraint, human beings are bound to use shortcuts in arriving at financing decisions (Vetschera, Campo, Pauser & Steiner, 2016). Traditional finance theory relies on fundamental principles in arriving at capital structure. For instance, an optimal capital structure should be informed by a reasonable and proportional application of debt and equity to support balance sheet strength in terms of asset base (Loth, 2017). However Modern reviews on determinant of capital structure argue that heuristic bias can affect financing decisions of companies. Heuristics may reduce the cognitive biases associated with decision making in so many aspects: they give the user an opportunity to careful examine signals and/ or alternative choices in decision making; additionally they reduce the work in storing and retrieving information, heuristics are significant in minimizing the cost and time associated with complex decisions making (Shah and Opphhenheimer, 2008).

A few studies have attempted to bring into perspective the role played by heuristic bias on capital structure of firms. Esghaier (2017) in the study capital structure choices and behavioral biases concluded that there was a positive impact of manager's overconfidence on their pecking order preferences as there was for optimism and overconfidence on leverage levels. Bellouma and Belaid (2016) show that loss aversion, self-serving biases, overconfidence, anchoring bias and representative bias have a positive relationship with the manager's decision on working capital structure. Abdin, Farooq, Sulatana and Farooq (2017) also demonstrated that availability and representativeness is the strongest predictor of investment performance followed by overconfidence. Kimeu, Anyango and Rotich (2016) indicated that behavioral factors which included heuristics positively influenced investment decisions at Nairobi securities exchange. The study concentrated on herding, heuristics and rationality. Kungu (2016) findings indicated that anchoring bias, excessive optimism and random walk bias had a significant impact on investor decisions. This observation leads to a conclusion that while international reviews have attempted to look at heuristics in relation to capital structure, local studies (Kenya) have concentrated on investments and heuristic bias with very limited research in capital structure and heuristics. This is the research gap that this study seeks to fill.

2. Research Methodology

2.1 **Research Design**

Descriptive research design was adopted for this study. It is defined as the process where data is collected with an aim of testing a hypothesis and respond to questions concerning the subject status of the study at that moment. Descriptive research design would endeavor to determine and report the way things are. It describes such things as possible behavior, values, attitudes and characteristics. Using this design ensured in depth analysis and description of a variety of phenomena being investigated hence it was appropriate for this study (Churchil, 1991)

2.2 **Population of the Study**

The population for the research consisted of 44 companies listed at Nairobi securities exchange (NSE 2017). A census survey was adopted to collect data from these 44 firms listed at Nairobi Securities Exchange. 11 firms from the banking sector and 6 from the insurance sector were excluded because they are regulated.

2.3 **Data Collection**

Data to test the biases was collected using a semi-structured questionnaire and Likert scale tables. 44 questionnaires were administered to 44 financial managers who are in charge of financing decisions. Drop and pick procedure was adopted. These questions were meant to enhance production of relevant evident upon which information for analysis and thereafter conclusions were drawn. Secondary data was used for capital structure and control variables. The secondary data to be collected included total debt to equity ratio to measure capital structure, total sales to measure size of the firm, return on assets ratio to measure profitability of assets, fixed assets to total assets ratio to measure tangibility and finally ratio of fixed assets for current year to total assets previous year to measure growth opportunities was used. This data was collected from published financial statements from online sources and past newspapers. The study period was 2015, 2016, 2017 and 2018 financial years.

2.4 Validity and Reliability

Validity refers the accuracy with which a test measures what it is intended to measure (Mason & Bramble, 1989). Three basic approaches are construct validity, content validity and criterion related validity. The study ensured validity by pilot questionnaires so that any response that was out of context could be re-evaluated and proper questions asked.

Research instruments are said to be reliable if they consistently yield similar results on repeated trials. It should give consistence results when using different instruments (Carmine and Zeller, 1979). In order to ensure reliability, the study used (Cronchbach's coefficient of alpha, Cronchbach, 1946). The coefficient is considered better the closer it gets to 1.0. In general, α <0.6 are considered to be poor while $0.7 \le \alpha \le 0.8$ is considered desirable.

2.5 Data analysis

Data was analyzed using statistical tools which are ANOVA and regression model in order to know the relationship and effect of heuristics on capital structure. Data collected from the questionnaires and published financial reports were tabulated, coded and processed using a computer Statistical Package for Social Science (SPSS). The analytic model was:

$$Y = \beta_0 + \beta_1 X_{1+} \beta_2 X_{2+} \beta_3 X_{3+} \beta_4 X_4 + \beta_5 X_5 + \in$$

Where:

Y = Capital Structure, X_1 = Heuristic bias X_2 = size of the firm, X_3 = profitability, X_4 = tangibility, X_5 = growth opportunities, € = Error term, $β_0$ = Constant term, $β_1$, $β_2$, $β_3$, $β_4$, and $β_5$ are the regression co-efficient of independent variables.

3. Results

3.1 Descriptive Analysis

This study analyzed the data collected and tabulated the mean, median, mode and standard deviation of the independent variables' heuristic bias (Anchoring Bias, Representative Bias and Availability Bias) and the dependent variable (capital structure). Control variables included in the model are firm size, profitability, tangibility and growth opportunities. From the results of the descriptive statistics, heuristic bias had a mean of 3.8191, median of 3.6700, mode of 3.67 and standard deviation of 0.39497. Firm size had a mean of 13.6386, a median of 13.200, mode of 13.20 and standard deviation of 2.86355. Profitability had a mean of 0.3374, median of 0.100, mode of 0.1, and standard deviation of 1.84562. Tangibility had a mean of 0.6883, median of 0.6, mode of 0.8 and a standard deviation of 1.15462. Growth opportunity had a mean of 3.9698, median of 0.35, mode of 0.1 and standard deviation of 5.74388. Capital structure had a mean of 2.6675, median of 0.8, mode of 0.1 and standard deviation of 5.00586. The Table 1 shows the findings summary of the descriptive statistics.

Table 1: Descriptive Statistics Descriptive Statistics Profitability Tangibility Growth Firm size

Capital Heuristic bias Structure **Opportunities** N Valid 53 46 57 58 46 46 Mean 2.6675 .3374 3.8191 13.6386 .6883 3.9698 Median .8000 3.6700 13.2000 .1000 .3500 .6000 Mode .10 13.20 3.67 .10 .80 .10 Std. Deviation 2.86355 5.00586 .39497 1.84562 1.15462 5.74388

Source: research data 2018

3.2 **Correlation Analysis**

From Table 2, heuristic bias has a weak positive correlation with capital structure of 0.024 with p value of 0.872. Firm size had a weak negative correlation of -0.036 with a p value of 0.798, profitability had a weak positive correlation of 0.016 with a p value of 0.911, tangibility had a strong positive correlation of 0.749 with a p < 0.001 and growth opportunities had a weak negative correlation -0.021 with a p value of 0.892. Only tangibility is statistically significant in explaining variations in capital structure. All other independent variables are statistically insignificant in explaining changes in capital structure.

Correlations Capital Heuristic Firm **Profitability** Tangibility Growth structure Bias Size opportunities Capital Pearson 1 Correlation Structure Pearson .024 1 Heuristic Bias Correlation Sig. (2-tailed) .872 Pearson -.036 -.074 1 Correlation Firm Size Sig. (2-tailed) .798 .623 Pearson .016 -.173 .152 1 Correlation **Profitability** Sig. (2-tailed) .249 .259 .911 Pearson .749** .254 .211 .018 1

Table 2: Pearson Correlation

Source: Research data 2018

.159

.167

.267

.906

-.094

.533

-.076

.616

1

.088

-.014

.925

3.3 Regression Analysis

Correlation

Sig. (2-tailed)

Pearson

Correlation

Sig. (2-tailed)

.000

-.021

.892

Tangibility

Growth

opportunities

The coefficient of determination was found to be 0.598 which implies that 59.8% of independent variables (heuristic biases, firm size, profitability, tangibility and growth opportunities) explain variations in capital structure. The remaining 40.2% can be explained by other variables not considered in this study.

The regression model was as follows:

**. Correlation is significant at the 0.01 level (2-tailed).

$$Y = 16.272 - \quad 2.814X_1 \quad - \quad 0.413X_2 + 0.029X_3 + 3.962X_4 + 0.077X_5$$

Where X_1 = heuristic biases, X_2 = firm size, X_3 = profitability, X_4 = tangibility, X_5 = Growth opportunities.

Heuristics had a statistically significant relationship with capital structure ($\beta = 0.08$, p<0.05). Among the control variables, size and tangibility had a statistically significant relationship with capital structure (p<0.05). However, profitability had an insignificant relationship with capital structure (p>0.05).

This is depicted in Table 3

| Coefficients | | | | | | | | | |
|----------------|--------|--------------|--------------|--------|------|--|--|--|--|
| Model | Uns | standardized | Standardized | t | Sig. | | | | |
| | C | oefficients | Coefficients | | | | | | |
| | В | Std. Error | Beta | | | | | | |
| (Constant) | 16.272 | 5.803 | | 2.804 | .008 | | | | |
| Heuristic bias | -2.814 | 1.349 | 209 | -2.086 | .043 | | | | |
| Firm size | 413 | .173 | 241 | -2.385 | .022 | | | | |
| Profitability | .029 | .263 | .011 | .111 | .912 | | | | |
| Tangibility | 3.962 | .468 | .859 | 8.471 | .000 | | | | |
| Growth | .077 | .090 | .083 | .852 | .399 | | | | |

Table 3: Coefficient of Independent Variables.

4. Conclusion

The study revealed that heuristic biases had a negative effect on capital structure. This had an implication that a unit increase in any of the heuristic biases would lead to a decrease in leverage levels. The study therefore concludes that heuristic biases have a negative effect on capital structure of firms listed at Nairobi securities exchange.

The study results also showed that firm size had a negative effect on capital structure. This implies that has the size of the firm increases, leverage levels decrease. As such, larger firms have lower leverage levels. Profitability had a positive effect on capital structure. This depicts that firms with high profitability levels employed high debt levels which contradicts the pecking order theory. Tangibility was found to have a positive effect on capital structure. This may be attributed to availability of assets which can be used as collateral to obtain debt. Lastly, growth opportunities showed a positive effect on capital structure. This implies that firms with potential investments tend to borrow more debt to finance their projects.

5. Recommendation of the Study

The study found that heuristic biases had a negative influence on capital structure. This means firms that are influenced by heuristics end up having less leverage levels. This will be acceptable for small firms but firms that have an eye for growth will

not find this attractive to them. The study therefore recommends that managers be educated on both the positive influence and negative effects of heuristic biases so that they can use it selectively and consciously when making financing decisions. They can also choose to avoid heuristics when it will have an adverse effect on their capital structure. The research further recommends that firm managers be able to draw a balance between proportion of debt and equity to finance activities of the firms based on valid fundamental principles as opposed to heuristics.

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APPENDICES

Appendix I: Questionnaire:

I am a student at the University of Nairobi, writing my Master in Business Administration research project on the effect of heuristic biases on capital structure of firms listed on Nairobi securities exchange. I kindly request you to take part of your time to complete this questionnaire. Your honest feedback is of highest importance in the course of my academic research. This information will not be used to serve any other purpose. Tick your answer in the brackets (\checkmark) provided.

Section A: Demographics

| 1. | How long | has | this | company | been | in | existence? | (kindly | tick | \checkmark | where |
|----|--------------|-----|------|---------|------|----|------------|---------|------|--------------|-------|
| | applicable). | | | | | | | | | | |

| i. | 10 years and below | () |
|------|--------------------|----|
| ii. | 11-20 years | () |
| iii. | 21-30 years | () |
| iv. | 31-40 years | () |
| v. | 41 years and above | () |

2. How long has this company been trading at Nairobi securities exchange? (Kindly tick √where applicable)

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i. Five years and below ()
ii. 5-10 years ()
iii. 11-15 years ()
iv. 16-20 years ()
v. 21 years and above ()
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3. What factors do you consider when deciding on whether to issue equity stocks) or debts (debenture or long-term debt)?

Section B: Anchoring Bias

4. Please tick the appropriate box where 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4- Agree, 5- Strongly Agree

Anchoring bias

| | Statement on indicators of anchoring bias | 1 | 2 | 3 | 4 | 5 |
|---|--|---|---|---|---|---|
| 1 | I frequently rely on recent information when making decisions on debt/equity issue | | | | | |
| 2 | When issuing debt or equity to finance the operations of the firm I consider the price of the previous period as a reference then adjust either upwards or downwards | | | | | |
| 3 | I usually make purchase decisions using the initial purchase price of the previous period. | | | | | |
| 4 | The choice between debt and external equity is based on 52-week high. | | | | | |

Section C: Representative bias

5. Please tick the appropriate box where 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4- Agree, 5- Strongly Agree

Representative bias

| Representative bias | | | | | | | |
|---------------------|---|---|---|---|---|---|--|
| | Statement on indicators of representative bias | 1 | 2 | 3 | 4 | 5 | |
| 1 | I am keen on choosing capital structure of recently posted results of performing companies. | | | | | | |
| 2 | I try to avoid choosing capital structure of companies with a history of poor earnings. | | | | | | |
| 3 | I rely on past performance to make capital structure decisions | | | | | | |
| 4 | I believe a good capital structure is from firms with good performance. | | | | | | |
| 5 | In my opinion, the last five years have seen my company adopt the capital structure of the best performed year. | | | | | | |

Section D: Availability bias

6. Please tick the appropriate box where 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4- Agree, 5- Strongly Agree

Availability bias

| | Statement on indicators of availability bias | 1 | 2 | 3 | 4 | 5 |
|---|--|---|---|---|---|---|
| 1 | I am keen on choosing capital structure of recently posted results of performing companies. | | | | | |
| 2 | My capital structure decisions depend on new and favorable information regarding debt and equity | | | | | |
| 3 | I usually avoid duplicating capital structure of the year that posted poor results. | | | | | |

Thank you for your participation.