# Do Financial Knowledge Moderates Loss Aversion Bias in Investment Decision?(A Short & Long Run Analysis from Pakistan Stock Market)

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**Abstract:** This study investigated the Loss Aversion bias effect on investment decision short and long term under the moderating role of financial knowledge in the Pakistan stock market both in short and long run collected data from a sample of 160 investors. In the methodology econometric techniques, i.e. Reliability analysis, statistics of demographic variables, descriptive, correlation analysis, and regression analysis has been applied. The results reveals that Loss Aversion bias negatively affects short and long term investment decisions. The increase in financial knowledge assures trading investors to take better investment decisions by reducing Loss Aversion bias. The study concluded that policymakers need to clearly understand and control market players' cognitive errors by developing effective policies to guarantee low stock volatility. The study also advises financial advisors, strategists, and banks better understand their investors' psychology during efficient portfolio management.

**Keywords:** Loss Aversion Bias; Investment Decisions; Financial knowledge; Pakistan Stock Market

## 1. Introduction

According to neoclassical economists, human beings' rational behavior allows them to make correct decisions in several situations and properly expect each detail of every outcome. However, in the real world, human behavior is restricted by judgmental errors named as behavioral biases (Shleifer, 2000). They take regular decisions and modernize beliefs in available limited information, which shows that investors are irrational than logical. Humans have limited information processing ability, which prevents them from behaving rational (Itzkowitz, Itzkowitz, &Rothbort, 2015). They try to construct an optimal investment strategy by adjusting and rebalancing portfolios over time. During this process,

investors make trading mistakes and face losses in the future. These are the psychological factors that confine investors from behaving rationally in the financial market (Babcock et al., 1995). Based on traditional financial theories such as Modern Portfolio Theory, Capital Asset Pricing Model (CAPM), and Efficient Market Hypothesis (EMH), investors are risk-averse and make rational decisions (Markowitz, 1952; Malkiel & Fama, 1970). These traditional theories have shown idealistic assumptions on human behavior.

The behavioral finance has encouraged researchers to examine human biases and provide a gateway to present realistic evidence on investors' psychological biases, especially during the time of financial crises in 2008 (Klapper, Lusardi, &Panos, 2013). Individual investors behave irrationally due to the existence of behavioral biases such as overconfidence, Loss Aversion bias, disposition effect, herding behavior, availability, anchoring, hindsight, and self-attribution bias which causes lousy investment decisions and results in the market in-efficiency (Mittal, 2019).

The institutional investors' trading behavior is different from individual investors. Institutional investors outplay due to access to firms' private information. This shows that transparent communication of information on financial products to investors is an optimal way to control behavioral biases, leading to market effectiveness (Nenkov et al., 2008; Itzkowitz et al., 2016).

The financial knowledge plays an important role in minimizing investors' irrational behavior. Individuals with a high level of financial knowledge face lower chances of behavioral biases, the propensity of financial knowledge, lies more in males than in female investors (Sezer and Demir, 2015). Moreover, the financial knowledge helps investors to control his/her cognitive biases such as anchoring, representative, Loss Aversion, availability, overconfidence, under confidence, gambling fallacy when trading in the stock market (Abreu & Mendes, 2010; Chen, Kim, Nofsinger, &Rui, 2004).

The situation of the global financial crisis in 2008 is the main reason to understand how financial knowledge can help reduce Loss Aversion bias to make improved buying and selling decisions. As limited financial knowledge bring worse investment decisions, financial knowledge is also necessary for market players to understand complicated financial products and effectively manage their portfolio investment (Mandell & Klein, 2009). Therefore, the paper intends to solve the research problem of bad investment decisions by examining financial knowledge as a moderator that would help to minimize Loss Aversion bias while making short term and long term investment decisions in the Pakistan stock exchange.

## 1.1. Scope & Significance of this Study

Researchers have commonly studied the association between behavioral biases, emotional biases, personality traits, financial literacy, and investment decision, but still, it requires deep study in existing knowledge of behavioral finance (Akhtar & Das, 2020; Rasool&Ullah, 2020, Siddiqui, 2019). Therefore, this research is motivated to provide a novel impact in understanding how Loss Aversion bias makes adverse buying and selling decisions and how it can be controlled by financial knowledge in Pakistan's emerging economy.

Behavioral biases are widely researched in recent studies, but the factor including Loss Aversion biases is unique to examine. There is an association between the stock market and economic development. The rise in stock market volatility increases systematic risk, which can negatively affect economic growth. It is

essential to understand why and how Loss Aversion bias influences temporary and permanent investment decisions to bring market stability, improve economic growth and investment decision.

Investors or market players should be well-educated in the area of financeto smartly mitigateand avoid Loss Aversion bias while makingeffective trading decisions. Researchers excessively studied the influence of behavioral biases on investment decisions. However, existing findings are still limited and require future study. Therefore, this study provides a novel contribution by analyzing how financial knowledge can reduce Loss Aversion bias to make healthier investment decisions in the Pakistan equity market.

### 1.2. Objectives of the Study
   i.   To examine the impact of Loss Aversion on investment decisions
   ii.  That Financial Knowledge prevails significant moderates the relationship between Loss Aversion bias and short term investment decisions?

## 2. Literature Review and Hypothesis Development

### 2.1. Literature on the Investment Decision

It is a decision made by the investors in acquiring financial assets today without consuming for producing high revenue in the future. An investment in financial assets is made on the long term and short term scales.

According to Twin (2020), the long term investment decision is spending money for more than a year on financial assets in the hope of getting higher revenue in the future. Investment decision for the short term is a temporary investment in marketable securities that can easily be convertible into cash within one year (Segal, 2020). Existing studies have shown the irrational behavior of humans. Investors during the thought process make common financial investment mistakes due to the presence of psychological factors, social, emotional and cognitive factors (Baker &Nofsinger, 2002).

Behavioral biases such as Representative biases, Availability biases, Anchoring biases, Overconfidence biases have a positive and significant influence on investment decisions (Shah, Ahmad, & Mahmood, 2018). It is also found that Loss Aversion biases, confirmation biases, familiarity biases, disposition biases have a significant and positive impact on the investment decision (Alrabadi, Al-Abdallah, &Aljarayesh, 2018).

### 2.2 Loss Aversion Bias

Loss Aversion bias has been derived from the Prospect theory worked by Kahneman and Tversky in 2013. Investors do not prefer to buy those securities that involve huge risks even if the propensity for profitability is high. These investors tend to hedge from loss by taking less risky investment decisions (Zamir & Ritov, 2012). The existence of financial knowledge plays the role of catalyst in amplifying overconfidence bias which causes minimum use of Loss Aversion bias. This behavior is more common in financial executives (Malmendier and Tate, 2015).

Sharma and Vasakarla (2013) found a significant relationship between gender and Loss Aversion bias. Women who use a high propensity of Loss Aversion bias are mostly under-confident in investment decisions compared to men who make smart moves during financial trade with less prone to Loss

Aversion bias. Hence, fear of loss prevents financial investors from thinking logically while rational investment decisions.

Investors adopt Loss Aversion bias by strongly avoiding the feeling of regret and the high negative impact of loss while trading in the financial market. It is also observed that high experience of gains or wealth above their reference point gradually makes investors less risk-averse, leading to an increase in share prices. It is also evident that investors seek high risk and become less risk-averse in buying stocks after increasing share price (bull market) above the reference point (Berkelaar &Kouwenberg, 2009). When investors face loss in the morning, they tend to adopt high risky behavior while trading in the afternoon (Coval& Shumway, 2005). These behaviors subsequently lead to a market bust. The market condition can significantly change investor's behavior towards Loss Aversion bias because investors become risk-averse in a bearish market than in a bull market (Hwang & Satchell, 2010). This cognitive bias develops the fear of loss in the bearish market while deterring investors from making rational judgments.

According to the above literature, the study developed the following hypothesis.

$H_1$. *Loss Aversion has a significant and negative impact on short term investment decisions.*
$H_2$. *Loss Aversion has a significant and negative impact on long term investment decisions.*

## 2.3    Literature on Financial Knowledge & Investment Decision

It represents the individual investor's capability to use its financial skills, concepts, and understanding to make the right choice by solving the financial problem in the stock market. Financial knowledge plays a significant role in influencing investor's financial decisions and market performance. Individuals with high financial knowledge competitively deal with sophisticated investment tactics (Fernandes, Lynch, & Netemeyer, 2014). Stock market performance increases with the participation of successful investors who have good analytical skills, financial knowledge, and social skills. They can defeat their psychological emotions and inner deceived behavioral biases. They cleverly forecast the behavior of market players and make efficient profitable decisions (Andraszewicz, 2020). Hence it is empirically proved from existing studies that investors with a high tendency of financial knowledge can switch their behavioral biases and experience good financial results as compared to those who are illiterate to financial knowledge and face the worst outcomes (Peters et al., 2019).

According to Jones, Bell, and Kao (2019), financial knowledge have a significant impact on investment decisions in short term and long term scales. Investors with a background in financial education can make proficient and rational decisions regarding particular finances. Financial knowledge and behavioral biases significantly influence an investor's wealth (Sekita et al., 2018). Investors make irrational decisions due to the presence of behavioral biases that may negatively influence their short and long-term investment decisions. However, investors with high financial knowledge can control cognitive biases and make rational investment decisions (Rasool & Ullah, 2020). Therefore, investors with a financial knowledge background can smartly manage their inner judgmental errors and make active investment decisions. Accordingly, the paper develops the following hypothesis:

$H_3$. *Financial Knowledge significantly moderates the relationship between Loss Aversion bias and short term investment decisions.*

*H₄. Financial Knowledge significantly moderates the relationship between Loss Aversion bias and long term investment decisions.*

## 3. Research Methodology

This research is conducted in the Pakistan equity market to analyze how investor's Loss Aversion bias influences short-term and long-term investment decisions under the moderating role of financial knowledge. Therefore, the targeted population included investors, brokers, and agents dealing on the Pakistan stock exchange.

The study used a self-reported questionnaire for collecting the relevant data. The study used convenient sampling techniques as the data is collected from the required population, including investors, brokers, and agents trading on the Pakistan Stock Exchange. This technique is deliberated to be more convenient, suitable, and economical rather than employing other techniques such as group discussions, experimental observation, or interviews. The study collected primary data for testing the proposed hypothesis.

The study delivered 200 total numbers of questionnaires directly to the market players. Out of 200, 40 questionnaires were dropped out as they were missing certain values and were incorrectly filled. Finally, the study contained 160 questionnaires with a response rate of 80%, which were filled by investors and further used for empirical analysis to get a reliable result. This methodology is also confirmed by existing studies (Shah et al., 2018; Ahmad, 2020).

The study used 5 points Likert scale in questionnaires to collect primary data. This Likert scale ranges from 'strongly disagree 1' to 'strongly agree 5'. All items were responded througha'5 point Likert scale'. The questionnaire consists of five sections. The first section describes the individual data of respondents while the remaining sections are discussed below. In the second section, two items were used to analyze short term investment decisions. In the third section, two items were used to measure long term investment decision. Similar to short term investment decisions, the item questions of long term investment decisions are also investigated. In the fourth section, three items were used to measure Loss Aversion Bias. In the fifth section, three items were used to measure financial knowledge.

The study used SPSS and AMOS 23 Graphic software. The study conducted Reliability analysis, Descriptive statistics, Correlation analysis, Demographic variables statistics, Average Variance Extracted (AVE), Composite reliability (CR), Confirmation Factor Analysis (CFA), and Structural Equation Modeling (SEM) for achieving the research objective.
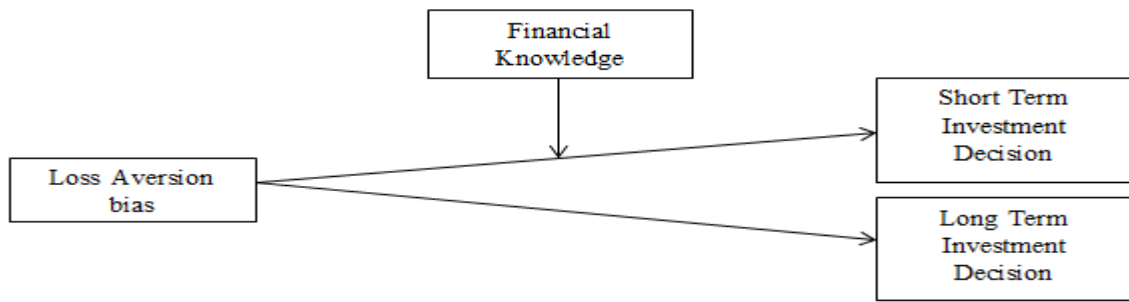
### 3.1. Conceptual Framework

**Figure 1: Proposed Framework**

## 4. Empirical Analysis & Findings

### 4.1 Reliability Test

Table 01 shows the reliability analysis. The study conducts this test to analyze the items' reliability included in variables. In this test, the values of all predictors are significantly greater than 0.6. It indicates that items assigned for each predictor are reliable for conducting further analysis.

*Table 01: Reliability Analysis*

| Variables | Cronbach's Alpha | *F*(sig) |
|---|---|---|
| Loss Aversion bias | 0.703 | 3.043(0.05) |
| Financial knowledge | 0.955 | 9.003(0.000) |
| Short term investment | 0.695 | 11.862(0.001) |
| Long term investment | 0.829 | 17.979(0.000) |

### 4.2 Demographic variables statistics:

Table 02 indicates the statistics of demographic variables. The research sample comprises 76% males and 23% females. The data is collected from investors having a different level of qualification and investment experience at different levels of their age.

*Table 02: Demographic Variable Statistics*

| Category | | Frequency | *%age* |
|---|---|---|---|
| **Gender** | Male | 122 | 76 |
| | Female | 38 | 23 |
| **Age** | 20-30 years | 68 | 42.5 |
| | 31-40 years | 75 | 46.9 |
| | 50 above | 17 | 10.6 |
| **Qualification** | SSC | 4 | 2.5 |

| | | | |
|---|---|---|---|
| | HSSC | 17 | 10.6 |
| | Bachlor"s | 43 | 26.9 |
| | MS/MPhil | 96 | 60 |
| **Investment Experience** | 0-5 years | 105 | 65.6 |
| | 6-15 years | 34 | 21.3 |
| | 16 above | 21 | 13.1 |

The demographic statistics show that most investors having MS/MPhil (approximately 60%), while 26.9% hold a Bachelor's degree, 10.6% hold a higher Secondary School Certificate (HSSC) and 2.5% hold a Secondary School Certificate. The sample's major portion contained investors with an age level of 31-40 years, which represents 46.9 %. 42.5 % represent investors with the age level of 20-30 years. 10.6% represents 50 and above age level. In terms of investment experience, 65.6% represents 0-5 years of investment experience. While 21.3% represents 6-15 years of investment experience and 13.1% represents 16 years and above investment experience.

### 4.3 Descriptive Statistics and Correlation Analysis
Table 03 shows the descriptive statistics and Pearson correlation coefficient between the four variables used in this study.

*Table 03: Descriptive Statistics and Correlation Analysis*

| Variables | Mean | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Short term investment | 4.0875 | .79017 | 1 | | | |
| Long term investment | 3.9969 | .74288 | 0.330** | 1 | | |
| Loss Aversion bias | 3.7208 | .72674 | -0.288** | -0.106** | 1 | |
| Financial knowledge | 3.9208 | .83385 | 0.241** | 0.450** | -0.149** | 1 |

N=160; **p<0.01

The result shows that Loss Aversion bias is negatively correlated to short term and long term investment decisions with the Pearson correlation of-0.288 and -0.106, respectively. In the same way, financial knowledge is positively correlated to short term and long term investment decisions with the Pearson correlation of 0.241 and 0.450, respectively. However, financial knowledge is negatively correlated to Loss Aversion bias with a Pearson correlation of-0.149.

### 4.4 Confirmation Factor Analysis

Figure 2 represents the Measurement Model. The study executed CFA by executing Amos 20 graphic software to remove items having low standard factor loading. All the factor loadings coincide with a significant *p* value that is p<0.001. According to model fit in table 05, all factor loadings were in acceptable series, where Chi -square to degree of freedom CMIN/DF is 3.011, Goodness of fit index GFI is 0.904, Comparative fit index CFI is0.950, Normed fit index NFI is0.928, Adjusted Goodness of fit index AGFI is0.817, Root mean square error of approximation RMSEA is0.0112 and Root mean square residual RMR is 0.050 represents good model fitness.

**Table 04: Validity and Reliability Analysis**

| Variables | AVE | CR |
|---|---|---|
| Loss Aversion Bias | 0.549 | 0.708 |
| Financial Knowledge | 0.556 | 0.767 |
| Short Term investment | 0.888 | 0.959 |
| Long Term investment | 0.709 | 0.830 |

**Notes(s):** CR= Convergent reliability AVE= average variance extracted

Table 04 shows the values of convergent validity (CV) and average variance extracted (AVE). The study used AVE and CV for testing the reliability. The convergent validity, also known as average variance extracted (AVE), was performed to approve the measurement model. In this article, the value of AVE and CR is within the acceptable range that is AVE must be greater than the value of 0.5 and CR must be greater than the value of 0.7. This measurement model is accepted because of the AVE value that ranges from 0.549-0.888. CR values range from 0.708-0.959. These values represent that the study consist of a reliable measurement model. The realization of all approaches for the measurement model's fitness allowed this study to continue for the SEM technique.

| Table 05: Model Fit Summary | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Models | CMIN | DF | CMIN/ DF | GFI | CFI | NFI | RMR | AGFI | RMSE A |
| Measurement | 87.321 | 29 | 3.011 | .904 | .950 | .928 | .050 | .817 | .0112 |
| Structural | 77.968 | 30 | 2.598 | .984 | .960 | .965 | .044 | .820 | .0206 |
| Acceptable Range | - | - | 1–3 | >0.90 | >0.95 | >0.90 | <0.09 | >0.80 | <0.08 |

Table 5 shows that each latent variable's factor loading was statistically significant and above the level of 0.5. All conditions for the fitness of the measurement model permitted this study to conduct an SEM analysis.

### 4.5 Structural Equation Modeling

The study represents model structure in figure 3. SEM technique is executed to test the proposed hypothesis. The results in table 05 shows acceptable values of model fit which specify CMIN/DF is 2.757, root mean square residuals (RMR) is 0.04, good fit indices (GFI) is 0.984, Adjusted goodness of fit index (AGFI) is0.82, RMSEA= 0.0206, normed fit index (NFI) is0.965, and comparative fit index (CFI) is 0.960.
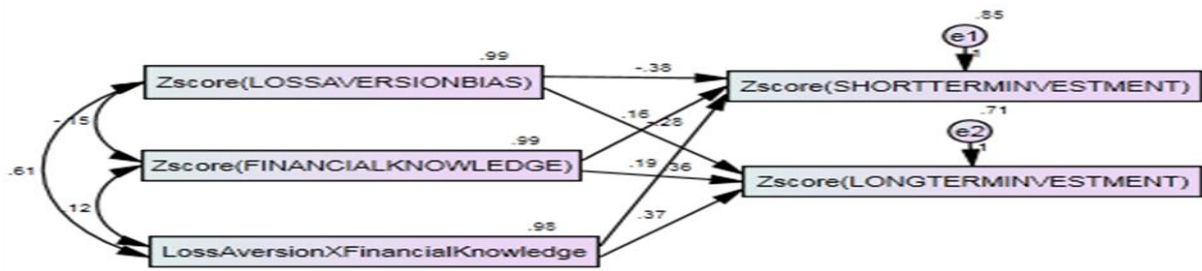
**Figure 3: Structural Equation Modeling**

Table 06 shows that Loss Aversion bias is negatively related to short term and long term investment decisions. After conducting analysis, the results illustrate significant negative impact of Loss Aversion bias on short term and long term investment decisions having ($\beta$ = -0.381, p= 0.000; $\beta$ = -0.283, p = 0.002). These results support the hypothesis of $H_1$ and $H_2$. Similarly, the interaction term shows the positive impact of financial knowledge on short term and long term investment decisions. It means that financial knowledge moderates the relationship in such a way that it weakens the negative association between Loss Aversion bias and short term and long term investment decisions ($\beta$ = .375, p= 0.000; $\beta$ =0.191, p=0.05), thus supports hypothesis $H_3$ and $H_4$.

**Table 06: Path Modeling**

| | | Estimates $\beta$ | SE | CR | *p*value |
|---|---|---|---|---|---|
| | **Result of Direct effect** | | | | |
| H1 | Short term investment → Loss Aversion bias | -.381 | .098 | -3.903 | 0.000 |
| H2 | Long term investment → Loss Aversion bias | -.283 | .089 | -3.173 | 0.002 |
| | **Result of Moderating effect** | | | | |
| H3 | Short term investment → Loss Aversion *Financial Knowledge | .191 | .098 | 1.948 | .051 |
| H4 | Long term investment → Loss Aversion * Financial Knowledge | .375 | .089 | 4.190 | 0.000 |

The research findings specify that Loss Aversion bias negatively and significantly influences short term and long term investment decisions. It shows that investors do not take effective financial decisions when they embrace Loss Aversion bias. In terms of investors' psychology, investors' Loss Aversion bias worsens the adequacy of investment decisions. Investor's high propensity of Loss Aversion bias varies with the change in financial conditions of the market. They are more loss averse in a bull market than in a bearish market. As a result, investors make bad investment decisions. They often observe the stock performance portfolio, leading to myopic Loss Aversion bias (high sensitivity of loss) and generates low trading volume as they prefer to avoid the loss than to attain gain (Lee Veld-Merkoulova, 2016). The result is consistent with (KHAN, Azeem, &Sarwar, 2017). Financial knowledge reduces cognitive errors due to behavioral biases that as Loss Aversion bias while making investment decisions. So it is observed that investors with a high level of financial knowledge effectively reduce their fear of loss, enabling them

to make proficient temporary or permanent investment decisions. The result is reliable with existing studies (Chen et al., 2004; Rasool and Ullah, 2020).

## 5. Conclusion, policy implications and Future Directions:

The study demonstrates that Loss Aversion bias adversely affects short term and long term investment decisions. This study has contributed to the existing literature by combining behavioral biases and cognitive psychology with investors' decisions regarding investing in the short term and long term assets. This study has provided a theoretical contribution by exploring the relationship between Loss Aversion bias and investment decisions. It is found that Loss Aversion bias leads to ineffective short term and long term investment decisions but financial knowledge can help to reduce Loss Aversion bias and make a better investment decision. Most of the market players may focus on the financial situation in the capital market, but ignores how their behavioral biases can affect their investment decision. Therefore this study is new and essential in an emerging economy where investors are unfamiliar with their cognitive psychology. The study findings explicitly show that investors must know the type of behavioral bias that exists in them when they make investment decisions. They should consult financial advisors if they lack financial knowledge and should avoid Loss Aversion bias (fear of loss) in making investment decisions. They should critically analyze, develop an effective investment plan, objectives, and put a certain restriction in availing short term and long term investment opportunities.

### 5.1. Policy Implication

The research provides practical implications by advising the policymakers of Pakistan's security exchange commission. This article is significant for the authorities of Pakistan's capital market. These governing authorities must improve investors' financial knowledge by providing them financial education on complicated trading assets. They should train market players on daily financial practices. Financial knowledge on buying and selling complex financial assets can help them to make an effectively diversified portfolio in a risky situation. Understanding behavioral biases can give a clear concept of how psychological and emotional factors adversely influence financial trade. Holding on to financial knowledge can help to control loss Aversion biases that might reduce the tendency of cognitive error or irrational judgments while making investment decisions.

The research provides beneficial practices to Pakistan's equity market and business players trading behavior. Knowledge of financial practices and cognitive biases can bring positive change in investors' investment decisions' efficiency and effectiveness. Awareness concerning financial education and cognitive bias can not only help investors to be rational by making improved and satisfying trading decisions but it can also help to maintain stock market stability by reducing stock market volatility or systematic risk. This might attract and increase foreign ownership which possibly will develop and prosper Pakistan's' developing economy.

### 5.2. Direction for Future Study

This study also recommends some future directions.

i.  The researchers should examine how other behavioral biases including Familiarity bias, Confirmation bias, Regret aversion bias, and Disposition effect, influence investment decisions.
ii. The future study can also examine the influence of personality traits and emotions like fear, anger, sadness, and happiness on financial performance under the moderating role of the investment algorithm. The sample size should be increased.

iii. Further study should also examine how Loss Aversion bias can be positively used for making efficient investment decisions.

iv. How the COVID-19 outbreak has an influence on investment decisions in the mediating role of behavioral biases. The future study should also analyze the Hierarchical moderating regression analysis to make results more robust.

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