

The Effect of Recency, Frequency, and Monetary on Investment Decision

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ARTICLE INFORMATION

Publication information
Research article

HOW TO CITE

Sutyanto D. N., Achsani N. A., Sembel, R., & Andati, T. (2022). The effect of recency, frequency and monetary on investment decision. *Asia Pasific Journal of Management and Education*, 5(2), 1-11.

DOI:

<https://doi.org/10.32535/apjme.v5i2.1542>

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Received: 07,JUNE,2022

Accepted: 30,JUNE,2022

Published: 20,JULY,2022

ABSTRACT

The dynamic behavior of individual investors provides the basis for the analysis related to recency, frequency, and monetary. It aimed to find out a certain pattern in buying or selling the shares. This condition encourages to prove scientifically the phenomenon that occurred. The investment behavior data used were for five years to ensure the change in the investment behavior patterns. The analysis used is Kruskal Wallis' analysis because the data were categorized as abnormal. The results of the study showed that investor behavior could be grouped using the recency, monetary, and frequency approaches. The recency variable has an influence on the investment decisions of individual investors. The RFM analysis used in consumer grouping was not entirely affected by decision-making. The recency variable descriptively has a random pattern every year so that no pattern is found in its effect

Keywords: Frequency, Monetary, Recency, Behavioral Finance, Investment Decision.

JEL: G11, G40

INTRODUCTION

The behavior pattern of individual investors can be seen from the investor's perspective as customers. It can be done through RFM analysis, namely recency, frequency, and monetary. Recency means the length of investor in the investment, frequency means how often investors invest in a certain period of time, and Monetary means the amount of investment value. RFM analysis is necessary and can provide useful insights for many investors and investment managers to help identify behaviors and develop effective strategies. Besides that, RFM is able to facilitate customer behavior (Buckinx & Poel, 2005). Personal investors are known to have a certain pattern in buying or buying a stock. Besides, investors will consider stocks based on various categories, namely blue-chip or non-bluechip categories and the industry. The buying and selling process carried out by individual investors has different amounts at each time. Therefore, it can be said that it is related to the amount of investment value.

The dynamic behavior of individual investors provides the basis for recency, frequency, and monetary analysis based on the database that has occurred. Hughes (1996) and Wang (2010) explain that a person's behavior can be predicted through previous behavior related to the frequency, the number of purchasing, and a certain unit of time. Kahneman and Tversky (1979) describe the prospect theory as the origin of the description of investor behavior that can change and cause by psychology, economic conditions, and social-environmental change. It shows that the theory formed has not been able to provide a consistent and rational illustration of investment behavior. Inconsistent investor behavior is then analyzed by paying attention to the tendency to sell shares in profit or loss. This is a form of prospect theory development where the finding of this theory is called disposition theory (Shefrin & Statman, 1985). These findings are then developed with the addition of surveys and experiments in order to find out more about the conditions (Odean, 1998).

The segmentation of investors can be grouped using the recency, frequency, and monetary approaches. Bult and Wansbeek (1995) explain that recency refers to the time interval between how the latest customer behavior can be observed. Frequency also refers to the number of transactions made by customers in a certain period, while monetary is related to the cumulative total of money spent by a customer on a product that bought it. Basically, the purpose of segmentation is to predict future customer behavior (direct better segmentation decisions). Basically, RFM segmentation is intended to get a description of the behavior of the databases that are important to manage.

Sumarwan (2011) reveals that consumer behavior is to understand why consumers do what they do. Consumer behavior is all activities, actions, and psychological processes that encourage these actions before buying. The RFM technique is based on three simple customer attributes, namely recency of purchase, frequency of purchase, and monetary value of purchase. The purpose of RFM Scoring is to predict future consumer behavior (leading to better segmentation decisions). Therefore, it is necessary to interpret consumer behavior in 'numbers' so that it can be used all the time. There are two scoring methods that can be used to assess RFM, namely customer quintiles and behavior quintiles (Miglautsch, 2000).

RFM Scoring is to forecast future consumer behavior (directing decisions to better segmentation). Therefore, Sohrabil and Khanlari (2007) researched on Customer Lifetime Value (CLV) Measurement Based on RFM Model and used the K-Cluster approach to determine the CLV of customers and segment them based on RFM. The data used in the study were obtained from a private bank in Iran. Furthermore, Sohrabil and Khanlari (2007) used discriminant analysis to determine the resulting group that can be used to distinguish customers as the research sample. The first result of this study is the grouping of customers based on their RFM value. The resulting customer groupings were eight groups divided based on their respective RFM values. Each customer is given a code. For example, if a customer has each R, F, and M value lower than the average R, F, and M values for all customers, then the customer is assigned a code L (low), L (low), and L (low), and so on for all customers. Furthermore, from the discriminant analysis results, it is found that the resulting group can significantly be used to distinguish customers. From the research results, obtained marketing strategies that can be applied to each customer are grouped based on the coding.

Niyagas et al. (2006) conducted research on the grouping of e-banking customers using data mining and marketing segmentation. The study was conducted on e-banking customers in Thailand. The techniques used include Self-organizing Maps (SOMs), K-Mean algorithm, and RFM analysis used to group customers based on personal profiles and the use of e-banking. Furthermore, the Apriori algorithm is used to analyze the relationship between features in e-banking services. On the other hand, Rhee and Russell (2003) developed a new approach to the use of RFM information in determining which households are the company's targets, considering that there are two important problems associated with RFM variables, namely selection bias and RFM endogeneity. By using a latent variable formulation to obtain a household propensity to purchase a product, the two researchers used a methodology that could overcome the statistical limitations of the RFM model. To benchmark the proposed model, the research study considers four specifications of a standard probit RFM model there are: (1) without selection bias correction or endogeneity correction, (2) only with selection bias correction, (3) only with endogeneity correction, and (4) with corrections for selection bias and endogeneity. The objective is to find research that results in a household assessment approach that can be used on various customer databases. In the end, the role and influence of recency, frequency, and monetary become an important part that needs to be analyzed related to individual investors' investment decisions.

LITERATURE REVIEW

Customer Relationship Management

CRM (Customer Relationship Management) is a business strategy that combines processes, people, and technology. According to Sesariza (2018), she states that a lot of companies are using CRM to maintain its relationship with their customers. By using CRM, the companies will be able to find out their customers' needs and want so that emotionally they can be involved with each other.

The purpose of CRM is to find out fairly amount of the needs and behavior of customers, to provide an optimal service further, and maintain existing relationships because the key to the success of a business depends on how much

we know about customers and meet their needs. Therefore, it is difficult for a company to achieve and maintain leadership and profitability without the ongoing focus that can be placed on CRM.

Regardless of the size of an organization, businesses are still encouraged to use CRM to create and manage customer relationships more effectively. A good relationship with customers can ultimately lead to customer loyalty and retention, as well as profitability. In addition, the rapid development of the Internet and technology has greatly increased the marketing opportunities and has changed the management of the relationship between companies and their customers (Bauer et al., 2002).

CRM as an effective tool may have a considerable role in improving the quality of banking processes. CRM is a concentrated business strategy that integrates marketing activities, sales and customer support on a dynamic basis (Chalmers, 2006). One of the tools to be able to implement CRM is to use of RFM analysis.

Recency, Frequency, and Monetary

The concept of RFM was first introduced by Bult and Wansbeek (1995) and proved that RFM is the most effective concept when applied to transaction data by Blattberg (2008). RFM is a common approach for customer purchase behavior understanding. It also allows the identification of good customers by segmenting customers. According to Bult and Wansbeek (1995), RFM is mainly used for segmentation analysis in direct marketing. Through RFM, a marketer can sort out target customers from a massive list of customers for its marketing activity.

The RFM analysis model was first developed by Hughes (1996), which distinguishes important customers from a number of data by using three attributes: time interval (interval) of customer usage, frequency, and amount of money. The three attributes are described in detail as follows:

- 1) The recency of the last Purchase (R)
R represents the reviewer, which means the distance between the last time of use/purchase with the current time. The less the time interval, the greater the R-value.
- 2) Frequency of the purchases (F)
F represents the frequency, which means the number of transactions in a certain time period. Such as two purchases in one year, a one-time purchase in a month, and so on. The more the frequency, the greater the F value.
- 3) The Monetary value of the purchases (M)
M represents monetary, which means the amount of money used for purchases in a certain period of time.

The greater the monetary value, the greater the M value. Previous research showed that the greater the R and F values, the more likely customers would make transactions back to the company. While the higher the M value indicates the tendency of customers to buy the company's products or services. RFM is an effective attribute for segmenting customers.

The RFM model calculates when people buy, how often, and how much they buy. It is because past purchases of customers can effectively predict their future

purchase behavior. Consequently, firms can identify customers worthy of being contacted based on their past purchase behavior via the RFM model. This analysis is widely applied in database marketing and is a common tool for developing marketing strategies.

RESEARCH METHOD

The data were obtained from securities members of the Indonesia Stock Exchange. The data used in the demographics of individual customers were 3,911 data, or 0.65% of 602,916 individual investors listed shares in PT Kustodian Sentral Efek Indonesia (KSEI) as of November 15, 2017. Companies often use the characteristics of purchasing data known as Variables. RFM in selecting the best customers for marketing data collection (Hughes, 1996). Conceptually, the RFM variable was used for forecasting because recent buying behavior was often used as a reliable guide to indicate future buying behavior (Schmid & Weber, 1997).

Table 1. RFM Variable

Variable	Variable Concept	Indicator	Size	Scale
Recency	Customers who have just made transactions tend to respond better to the messages conveyed by securities companies	Calculation in a day unit. It is calculated from the last day of the transaction to the end of the year.	Last transaction per customer in 2012 - 2017	Ratio
Frequency	Customers who frequently make transactions tend to make transactions again compared to customers who do not regularly make transactions	The frequency (amount) of transactions where one day and counted as one transaction.	Transaction frequency per customer in 2012 - 2017	Ratio
Monetary	Customers with larger portfolios often respond better than customers with smaller portfolios.	The average transaction value obtained from the transaction value per year divided by the number of transactions	Transaction value recorded by securities companies in 2012 - 2017.	Ratio

Kruskal Wallis test is to determine the difference in the average of more than two groups. Kruskal Wallis test is used to replace the ANOVA test when the data are not normal. The Kruskal-Wallis test also does not require normal and homogeneous assumptions on the parent distribution. Kruskal Wallis test is a test used to determine the difference in the average of more than two groups. Kruskal

Wallis test is used to replace the ANOVA test when the data is not normal. The Kruskal-Wallis test also does not require normal and homogeneous assumptions on the main distribution.

Madani (2009) explained that RFM is a big data approach to determine the conditions, behaviors, and activities carried out in order to build patterns and associations that are useful for business development. Mohammadi et al. (2014) explained that RFM is a method for evaluating a condition related to activities carried out by many individuals. Hughes (1994) explains that RFM is used as the basis for distinguishing customers based on recency (last purchase), frequency (purchase frequency), and monetary (nominal purchase). Newell (1997) explains that the recency frequency monetary explains that it is effective and efficient to determine the ranking of the perpetrators.

Jonkera et al. (2004) explained that in the end, the RFM model could provide an overview of the behavior of individuals through a general model. Currently, the RFM approach can be used as the basis for ranking the active individuals in an ecosystem (Hsieh, 2004). Wei et al. (2010) explain that companies can gain many benefits by identifying, analyzing, and implementing RFM in business. This can have an impact on increasing responsiveness, lower-order costs, and grouping measurable profits. RFM analysis can provide an associated picture with a basis for examining customer transaction history, including observations of purchase time, purchase frequency, and purchase amount, and thus help identify significant and valuable customers (Miglautsch, 2000). Thompson (2002) explains that the developed RFM model can create a classification, group, and cluster of customers involved in the business. This has an impact on information and knowledge to make more appropriate strategic decisions.

The RFM approach needs to be clarified by defining each part with appropriate indicators. In this case, Noorizade et al. (2018) explain that recency can be defined as the time (years), frequency as registered orders, and monetary as the number of purchases. Liu and Shih (2005) confirmed that the indicators in the RFM differ from industry to industry, indicating that it is necessary to set appropriate priorities or constraints in order to achieve goals.

Aviliani (2011) researched the segmentation of micro-savings customers based on the RFM method, where the study results indicate that customers can be divided into several groups according to the results of the RFM. Customers with the highest RFM value only account for 5% of the total customers studied and tend to be outliers in demographic profiles. From previous research on RFM, it can be concluded that RFM allows us to analyze the behavior of consumer activities. In the capital market, the behavior of these activities can be related to the investment decisions made. For this reason, this study takes the following hypothesis:

H1: Recency has an influence on investment decisions.

H2: Frequency has an influence on investment decisions

H3: Monetary has an influence on investment decisions

RESULTS

The basic concept of Recency Frequency Monetary is related to the activities carried out by a person as measured by the number of days, the number of transactions, and the number of transactions. Bult and Wansbeek (1995) explain the grouping of individuals who perform the same activity to classify the class. The importance of recency, frequency, and monetary analysis is to process and improve the business activities and is a general tool for developing business strategies for better companies (Mohammadian & Mohammadreza, 2012).

This study used transaction data from securities customers who transacted from 2012 to 2017. The total data analyzed reached 32,132 transactions with a value of Rp 562.7 billion from 3,038 customers who actively transact and have completed the demographic data along with active portfolio ownership at the end of each year. If the customer makes a transaction but does not have a portfolio at the end of the year, it will be excluded from observation.

Each year it has a different number and behavior, it is an added value that needs to be analyzed further so it can be useful information. The processing method used the ANOVA approach with several conditions, namely: 1) come from an independent group. 2) the variance between groups is homogeneous. 3) the data must be normally distributed (Norman & Streiner, 1993). Therefore, a normality test was carried out as a prerequisite for the ANOVA test. The results of the normality test with the "Shapiro Wilk" approach as shown in Table 2.

Table 2. Normality Test of Recency, Frequency and Monetary

Year	Recency	Freequency	Monetary
2012	Abnormal	Abnormal	Abnormal
2013	Abnormal	Abnormal	Abnormal
2014	Normal	Abnormal	Normal
2015	Abnormal	Abnormal	Abnormal
2016	Normal	Abnormal	Normal
2017	Normal	Abnormal	Normal

Table 2 shows that there are some abnormal conditions each year. In addition, the processing process requires a common approach. Siegel (1988) offers a method, namely Kruskal Walis, as a way to perform a different test without the need to perform a normality test beforehand. The processing results are grouped based on recency, frequency, and monetary.

Recency is a concept of finding out the length of time since the last activity. Recency data are obtained by calculating the difference between the last day the customer makes a transaction and the last trading day in the year. The closer the last transaction is made, the more actively an investor performs the investment. This information is useful for describing investor behavior over time. Recency grouping into five groups, it is intended to make it easier to know the behavior of investors every time. Conditions that occur from time to time with descriptive differences, but it needs to be proven to find out a statistically significant relationship with investor behavior. The test is carried out with Kruskal walis by comparing recency (R) in each year with LQ45 (Y) share ownership. The

information on the test output using the crucible test approach as presented in Table 3.

Table 3. T-test of Kruskal-Wallis Recency to LQ45 Share ownership

Year	Asymp.Sig	Description
2012	0.01*	Accepted
2013	0.08	Rejected
2014	0.00*	Accepted
2015	0.27	Rejected
2016	0.00*	Accepted
2017	0.04*	Accepted
Seluruh	0.00*	Accepted

*significant at < 0.05 . (Recency affects LQ45 share ownership).

Table 3 provides information that investor behavior related to recency and stock portfolio ownership in 2012-2017 with different values. 2012, 2014, 2016, and 2017 resulted below 0.05, meaning there was a significant difference. Significant differences were found when using all the data. It confirms that the activities of investors can be distinguished from one another. Overall this test indicates that the activeness of investors in stock transactions associated with LQ45 share ownership was known to be different from one another. The distance between the mean values can provide additional information regarding the cause of the real difference. It is important to know the recency of individuals in making judgments through initial and final information (Ahlawat, 1999; Ashton & Kennedy, 2002). It is important to know the recency of individuals in making judgments through initial and final information (Ahlawat, 1999; Ashton & Kennedy, 2002).

The Frequency concept is a concept related to the number (high/low) of transactions performed. Frequency data were obtained by calculating the accumulated number of transactions made by customers during the observation period. There were 32,132 transactions that occurred and were carried out by customers who met the observation criteria, namely those who had a stock portfolio at the end of the observation period. It indicates that the investor is an active investor and dares to take risks if the transaction is higher. The frequency grouping is divided into five. It is intended to make it easier to know the level of activity of investors. Generally, the majority of the largest frequencies were described by investors who have LQ45 stock portfolios below 20 percent or risk-loving groups. All of these findings need to be proven by an approach through the Kruskal wallis test to ensure that there is a real difference in each year. The frequency of investor behavior can be related to one another but differs from time to time. This indicates that there is a relationship between investor behavior and activity to maintain portfolios. The frequency of investors' investment behavior needs to be further proven by comparing it with the percentage of share ownership in LQ45. The information is presented in Table 4.

Table 4. Kruskal-Wallis Test Frequency to LQ45 Share Ownership

Year	Asymp.Sig	Description
2012	0.187	Rejected
2013	0.266	Rejected
2014	0.126	Rejected

2015	0.476	Rejected
2016	0.543	Rejected
2017	0.396	Rejected
Overall	0.295	Rejected

* significant at < 0.05 . (Frequency affects LQ45 share ownership)

Table 4 provides information that the Asymp.sig value of the year was known to be more than 0.05. It indicates that there was no significant difference in each year related to the number of transactions carried out with LQ45 share ownership. Overall data tests were carried out to ensure the results of the same conclusions as to the previous test. This finding is due to the investment behavior of investors described in terms of frequency which tends to seek profit rather than reduce risk. Based on the results above, Hypothesis 2, namely "Frequency affects investment decisions," was rejected.

Monetary is related to the value of the transaction carried out by investors, in this case, related to the number of funds issued during the observation period. During the observation period, there were 32,132 transactions with a total value of Rp 562.7 billion. For instance, the investor made three transactions in 2012, with the value of each transaction being Rp. 100,000, then the recorded monetary is Rp. 300,000, which is the total value of the transactions made. Information on investor behavior is related to the number of funds invested in stocks to determine the pattern of maintaining the portfolio owned. Monetary from the investment behavior of investors is proven to be done by comparing it with the percentage of LQ45 share ownership and looking at different patterns of behavior. This information can be used as the basis for classifying investors based on investment funds. The T-test is needed to find out the relationship between monetary and the LQ45 portfolio of investors. The output results can be seen in Table 5.

Table 5. T-test Monetary to LQ45 Share Ownership

Year	Asy.(sig)	Description
2012	0.20	Rejected
2013	0.05*	Accepted
2014	0.00*	Accepted
2015	0.23	Rejected
2016	0.98	Rejected
2017	0.00*	Accepted
Seluruh	0.108	Rejected

* significant at < 0.05 . (Monetary affects LQ45 share ownership)

Table 5 provides different information, known the largest range of average values was in 2017 with an asym.sig value of 0.00 (Accepted "there was a significant difference). In this case, it is known that in 2013 it had an asym.sig value of 0.00 but the smallest average value range from other years. In testing each year, it is known that there were three years showing the difference and three years with no difference. The test was carried out with all data in order to get a general description. The test results showed a value of 0.108 or 10.8 percent, which exceeds 5 percent with the Rejected interpretation. This finding showed that the range of average values cannot always be used to determine the existence of a real difference. The transaction value (monetary) invested by investors at some

time had a significant difference with the LQ45 share ownership. Based on the results above, Hypothesis 3, namely "Monetary had an effect on investment decisions," was rejected.

CONCLUSION

This study tried to relate the investment decisions with investor behavior through RFM Variable. RFM is widely used to map consumer behavior so that companies can develop the appropriate marketing strategies. Of three variables, the Recency variable showed an influence on investment decisions represented by the share ownership portion of LQ45. However, when a descriptive analysis of the results was carried out, a random pattern was found each year. It indicates that the recency variable had a significant effect. Further research is needed on the relationship between the two variables. The recency variable had an influence on the investment of individual investors' decisions. The RFM analysis used in consumer grouping was not entirely affected by decision-making. However, the recency variable had a random pattern every year, so no pattern was found in its effect.

ACKNOWLEDGMENT

N/A

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest

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