A FINANCIAL BEHAVIOR MEASUREMENT MODEL TO EVALUATE THE FINANCIAL MARKETS

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ARTICLE INFO	ABSTRACT
	Purpose: This study examines the relationship between the financial behavior measurement models and evaluate the financial markets all sectors listed on Iraq Stock Exchange. The current study also to develop a quantitative model for measuring the financial behavior of investors in the financial markets, and thus knowing their behavior, therefore, determining the efficiency of the investment sectors that are being traded. **Theoretical framework**: Quantitatively measuring the financial behavior of investors is one of the important issues that have occupied specialists in the financial field due to its close relationship with the level of market efficiency, as well its global indexes. Financial behavior among the behavioral concepts related to the general situation of the investor whether with the knowledge, he possesses or the social situation in which he is present. **Design/methodology/approach**: The study uses the Quantitative and mathematical analysis. The sample data of this study includes the period from 2004, the date of the establishment of the Iraq Financial Market, until 2020. **Findings**: The study reveals consistent results with the model. The results show that the proposed model can be applied in any of the financial markets to know investors' behavior and show efficiency for the sectors in the financial market, as well important findings of the study is the inefficiency of most sectors. In addition to that, some sectors in it with performance and efficiency are almost the same during the study period. **Research, Practical & Social implications**: This study helps Investors and companies on determining the efficient sectors and therefore identifying profitable sectors and selecting them for trading. **Originality/value:** The findings suggest several Important results for the fields Financial behavior, and efficiency evaluation in financial markets, It has been developed a quantitative model for measuring the financial behavior of investors in the financial markets, and thus knowing their behavior. The model has proven successful in identifying profitable and losing sectors in the Iraq Stock Exchange Doi: https://doi.org/10.26668/businessreview/2023.v8i5.1417

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UM MODELO DE MEDIÇÃO DO COMPORTAMENTO FINANCEIRO PARA AVALIAR OS MERCADOS FINANCEIROS

RESUMO

Objetivo: Este estudo examina a relação entre os modelos de medição de comportamento financeiro e avalia os mercados financeiros de todos os setores listados na Bolsa de Valores do Iraque. O presente estudo também pretende desenvolver um modelo quantitativo para medir o comportamento financeiro dos investidores nos mercados financeiros, e assim conhecer o seu comportamento, portanto, determinar a eficiência dos setores de investimento que estão sendo negociados.

Referencial teórico: Medir quantitativamente o comportamento financeiro dos investidores é uma das questões importantes que tem ocupado os especialistas da área financeira devido a sua estreita relação com o nível de eficiência do mercado, bem como seus índices globais. Comportamento financeiro entre os conceitos comportamentais relacionados à situação geral do investidor seja com o conhecimento que possui ou com a situação social em que está presente.

Desenho/metodologia/abordagem: O estudo utiliza a análise quantitativa e matemática. Os dados da amostra deste estudo incluem o período de 2004, data do estabelecimento do Mercado Financeiro do Iraque, até 2020.

Resultados: O estudo revela resultados consistentes com o modelo. Os resultados mostram que o modelo proposto pode ser aplicado em qualquer um dos mercados financeiros para conhecer o comportamento dos investidores e mostrar eficiência para os setores do mercado financeiro, bem como achados importantes do estudo é a ineficiência da maioria dos setores. Além disso, alguns setores com desempenho e eficiência praticamente os mesmos durante o período de estudo.

Pesquisa, implicações práticas e sociais: Este estudo ajuda investidores e empresas a determinar os setores eficientes e, portanto, identificar setores lucrativos e selecioná-los para negociação.

Originalidade/valor: As descobertas sugerem vários resultados importantes para os campos Comportamento financeiro e avaliação de eficiência nos mercados financeiros. Foi desenvolvido um modelo quantitativo para medir o comportamento financeiro dos investidores nos mercados financeiros e, assim, conhecer seu comportamento. O modelo provou ser bem-sucedido na identificação de setores lucrativos e perdedores na Bolsa de Valores do Iraque

Palavras-chave: Modelo de Medição do Comportamento Financeiro, Comportamento do Investidor, Mercados Financeiros.

UN MODELO DE MEDICIÓN DEL COMPORTAMIENTO FINANCIERO PARA EVALUAR LOS MERCADOS FINANCIEROS

RESUMEN

Propósito: Este estudio examina la relación entre los modelos de medición del comportamiento financiero y evalúa los mercados financieros de todos los sectores que cotizan en la Bolsa de Valores de Irak. El presente estudio también pretende desarrollar un modelo cuantitativo para medir el comportamiento financiero de los inversionistas en los mercados financieros, y así conocer su comportamiento, y por ende, determinar la eficiencia de los sectores de inversión que se están negociando.

Marco teórico: La medición cuantitativa del comportamiento financiero de los inversionistas es uno de los temas importantes que han ocupado a los especialistas en el campo financiero debido a su estrecha relación con el nivel de eficiencia del mercado, así como sus índices globales. Comportamiento financiero entre los conceptos conductuales relacionados con la situación general del inversionista ya sea con el conocimiento que posee o la situación social en la que se encuentra.

Diseño/metodología/enfoque: El estudio utiliza el análisis cuantitativo y matemático. Los datos de muestra de este estudio incluyen el período desde 2004, fecha del establecimiento del Mercado Financiero de Irak, hasta 2020.

Hallazgos: El estudio revela resultados consistentes con el modelo. Los resultados muestran que el modelo propuesto se puede aplicar en cualquiera de los mercados financieros para conocer el comportamiento de los inversionistas y mostrar la eficiencia de los sectores en el mercado financiero, así como hallazgos importantes del estudio es la ineficiencia de la mayoría de los sectores. Además de eso, algunos sectores con rendimiento y eficiencia son casi los mismos durante el período de estudio.

Investigación, implicaciones prácticas y sociales: este estudio ayuda a los inversores y empresas a determinar los sectores eficientes y, por lo tanto, identificar sectores rentables y seleccionarlos para negociar.

Originalidad/valor: Los hallazgos sugieren varios resultados importantes para los campos Comportamiento financiero y evaluación de la eficiencia en los mercados financieros. Se ha desarrollado un modelo cuantitativo para medir el comportamiento financiero de los inversores en los mercados financieros, y así conocer su

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comportamiento. El modelo ha demostrado ser exitoso en la identificación de sectores rentables y perdedores en la Bolsa de Valores de Irak.

Palabras clave: Modelo de Medición del Comportamiento Financiero, Comportamiento de los Inversores, Mercados Financieros.

INTRODUCTION

In this study, a quantitative model was created to measure the financial behavior of investors using mathematical modeling techniques, we are developing, to measure the financial behavior of investors in the financial market depending on some financial data provided by the Iraqi Stock Exchange and Iraqi Securities Commission in their financial bulletins noting that it is possible to develop this model in the future to measure financial behavior at the individual level, that the relationship between Investors and the risk structure directly affects the general index of the financial markets, and since the behavior of investors and their financial decisions are related by the general behavior of the investor himself, and thus this matter is not measurable. Therefore, this study came to present a quantitative model through which the financial behavior of investors can be measured through the use of mathematical modeling techniques. Investing the financial markets is a very complex matter, and this complexity increases due to the presence of large numbers of investors in the financial market, and these investors possess multiple behavioral patterns and results in a clear difference in investment decisions. The investors use various information search strategies to help them make trading decisions and this information forms a picture of the herd's behavior in the financial markets.

Finance behavioral science from the new topics raised in recent years in the field of finance and investment. Where the relationship between financial sciences and other sciences has caused researchers to do research regarding the behavior of investors in the financial markets and what could happen in their reactions to different situations (Nouri, Motamedi, & Soltani, 2017). A new era for financial management began mainly depends on understanding and study of human emotions, behavior, and sentiments quantitatively has been started which was earlier dominated by the study of financial markets (Zahera & Bansal, 2018). One relatively recent development of financial science is an intensification of research in behavioral finance, a field which the Academy of Behavioral Finance & Economics describes as quite promising (Shkvarchuk & Slav'yuk, 2019). The financial behavior is a species of economic behavior, that fulfills cumulatively a series of characteristics necessary and sufficient (Dinga, Pop, Dimitriu, & Milea, 2011). Investment decisions are seen as an iterative process of interactions between the investors, and this investment process is influenced by a number of interdependent variables

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that are driven by quantitative systems (Lovric, Kaymak, & Spronk, 2008). Investors' behavior and expectation is a very important factor in the investment analysis in the financial markets that needs to be analyzed by all alternative sectors of investment (Selvaraj, Shamina, & Dhanya, 2011). The quality of information source has an impact on investor behavior as a piece of news reliable may lead to more trading than from a less trustworthy one. So in behavioral finance literature, a few studies have modeled the trading behaviors of investors based upon the insights taken from psychology (Tauni, Fang, & Iqbal, 2016). However, the modeling of investors' financial behavior did not depend on mathematical equations. Financial markets have the difficult task to similarly identify future clients' behavior to educate them about the risks associated with investing in extremely high return investment opportunities. These types of investments are not beneficial investing behavior but potential destroying behavior for financial markets (Xiao & Porto, 2019). Therefore, investors' behavior must be precisely defined, and this is what our study attempts to do. Investors in the financial markets are increasingly responsible for making sound financial decisions to maximize profits and reduce the risks associated with the stocks they trade ad this financial behavior of investors must be understood as a complex phenomenon made up of a combination of knowledge, attitude, and behavior, which lends sense to the use of a multidimensional view to conceptualize that behaviors (Ramalho & Forte, 2019). Behavioral finance for investors is a study of the markets that draws on psychology, throwing more attention because people buy or sell the stocks many at the moment (Rezaei Z. , 2013). Financial behavior refers to the study of the effect of psychology on the behavior of investors. This includes showing the use of decision-making processes to psychology in recognizing and forecasting the financial markets to achieve the maximum profit possible. So Financial behavior studies the effect of psychological processes in decision-making (Rezaei & Elmi, 2018) which has a vital role for every individual (Arofah, Purwaningsih, & Indriayu, 2018). Financial behavior mediates between the influence of financial knowledge and locus of financial control (Iramania & Lutfia, 2021). The financial behavior of the investors is fundamentally based on behavioral biases or overconfidence. It is the situation when people are highly optimistic about the trading outcomes and they suppose that the information they have is adequate for them to make sound investment decisions and their behavior is completely rational (Zahera & Bansal, 2018). A research into investors' behavior has received a lot of consideration during in the last period, and is increasingly in the focus of interest of many scientists financial studies (Lovric, Kaymak, & Spronk, 2008). Understanding the cases help investors to design an optimized investment strategy to help them

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to reach their purposes (Rezaei Z. , 2013). Financial behavior is associated with one's responsibility regarding their way of managing his investments, and that financial culture for investors has an influence on financial behavior (Andarsari & Ningtyas, 2019). To be more complete, financial behavior should be combined with a mathematical model predicting the quantity of money involved in the transactions conducted in the financial markets, as well as a model predicting the moment of the decision for investors (Robin & Bierlaire, 2012). Definition for financial behavior includes exhibiting rational financial habits for investments low risk and profitability high and having control over finances (Angulo-Ruiz & Pergelova, 2015). Financial behavior has an important role in the decision-making process of investors and it is a good theory to understand and explain feelings and cognitive errors affecting investment decision making for investors (Meliza, Sadalia, & Fachrudin, 2013). Financial behavior is of great importance which is manifested through the investors' decisions in the financial market that plays an important role in defining the market trend, which then influences the economy in general. Financial behavior directly affects the development of the financial system and the increase of the competitiveness of the financial markets (Gorshkova & Ksenda, 2020). It is reasoned that willingness to change financial behavior may play a pivotal role in the emotional and cognitive experiences associated with decisions and financial hardship (Fiksenbaum, Marjanovic, & Greenglass, 2017). To conclude, financial behavior depends on many objective and subjective factors such as cash income, inflation, currency exchange rates, interest rates on bank products, expectations, etc. (Nivorozhkina, Toropova, Yarashanova, & Batashev, 2015).

Our study is concerned with creating a mathematical model that helps us measure the behavior of investors in the financial markets and knows the extent of the efficiency of the financial markets, whether at the general level or at the level of different sectors. We aim to modeling the financial decisions of an investor during any period of time, and no previous study has been conducted yet. To quantitatively measure investor behavior, such measurement depends on the financial market data such as volume, value, etc. This study, thus, seeks to fill this cognition gap in the measurement of investors' behavior in financial markets.

LITERATURE REVIEW

Financial behavior is the level of change in the selection of the financing sources in the terms of ownership (Al_Duhaidahawi et al, 2020) Funding sources are divided into owned funding sources Which the owners pay to the organization from the paid-up capital which is the Common stock the other type is borrowed financing these are the loans taken by the owners

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in order to complete the capital requirements For the purpose of running the project (Shakatreh et al, 2022), Both sources are costly, the rate of return that the owners receive is the cost of the proprietary financing interest is the cost of borrowed financing. Borrowed financing provides the organization with tax protection by considering interest as a cost that is deducted from the revenues before the tax is imposed. (Al-Karawi et al, 2022), Changes in national economies may not be able to be calculated in advance. There are uncertainties that the organizations cannot know their financial needs, especially in cases where inflation rates exceed a reasonable level, which affects management decisions and planning operations (Ueda, 2017).

The organization's management may find that the funding allocated for the implementation of a new project or a new production line is not sufficient for the amounts allocated for implementation due to the high level of prices resulting from high inflation rates and resulting from uncalculated changes in the macro economy that constitutes the general environment of the organization.

Therefore, the organization resorts to searching for funds to fill the shortfall one of the sources of funding is resorting to the owners and issuing new shares to increase the required capital. These shares are bought from the old owners because they desire not to add new owners who may be able to influence the management's decisions (Dahl, 2012).

Therefore, the new shares are purchased by the old owners or financed by retained earnings

It is the profits belonging to the owners and is one of their basic rights It is forfeited to be reinvested.

Therefore, the level of financing owned increases compared to borrowed financing resorting to issuing new shares or retaining profits is always due to the absence of borrows from the organization or the inability to obtain the necessary financing or the lack of profits that are withheld or used to finance their needs. Everyone does not know this information because it is not available, but the directors of the organization understand the future estimates more than the owners know (Almshabbak et al, 2023).

MATERIAL AND METHODOLOGY

Various researchers had studied financial behavior models in financial markets during the last years. Table (1) below presents several financial behavior models and their findings which are studied by those researchers.

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Table 1: Financial Behavioral Models

Researcher	Model	The description	Model's findings
(Robin & Bierlaire, 2012)	$\dfrac{per \int \left(x_{t,t}\,(k)\right) - \left(x_{t,t-t\,H}\,(k)\right)}{\left(x_{t,t-t\,H}\,(k)\right)}$	logit model with latent classes	Financial behavior interpretable and quantify interesting related to investors' decisions by the predictive capabilities of the model.
(Meliza, Sadalia, & Fachrudin, 2013)	$Z\ score = a + W_1 X_1 + W_2 X_2 + W_3 X_3$	Discriminant analysis	Reach for the financial behavior through demographic variables
(Nouri, Motamedi, & Soltani, 2017)	$n = \dfrac{Z_{\alpha/2}^2\, S^2}{d^2}$	Use Cochran's formula	Financial, psychological, and social factors were considered as the most important external factors influencing the behavior of investors
(Rezaei & Elmi, 2018)	$nt = nt - 1 + yt$	Derived from the study of Burberris & colleagues	The reaction of the stock price in the stock market was modeled by the finance behavior approach.
(Xiao & Porto, 2019)	$FB = a + b \times PB + C \times PB^2 + DX + e$	15 financial behavior variables were used in an exploratory factor analysis	That some behavioral patterns are consistent with theoretical predictions that present biased consumers are more likely to spend in the present and less likely to save for the future.

Source: (Prepared by the authors (2023))

This study employs an applied methodology and the data are sourced from the Iraq Stock Exchange from 2004. It is the date of creation of a market to 2020. Financial behavior model could be directly implemented using mathematical or computational modeling techniques depending on the model provided by the researcher. Appendix (1) shows the data of the trading volume for the Iraq Stock Exchange, which started its activities in the middle of the year 2004 and in seven sectors: financial, investment, industrial, and service. As for the number of shares that were traded, it can be displayed in Appendix (2). To complete all variables of the proposed model, No. of trades must be determined, in addition to the sessions, which can be view through Appendix (3) and (4).

MAIN MODEL & ASSUMPTIONS

This study used the proposed model of the researcher. We use this model to estimate financial behavior for several reasons. First, not to use quantitative models to measure the financial behavior of investors. Second, this financial tool fits in small Sectors as in Iraq Stock Exchange, meaning one could use this model even if there are many sectors. Third, this model clarifies the relationship between the behavior of investors and the performance of the financial market. Finally, the model is considered a financially transformational to learn about the

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financial behavior of investors, The FBMM model, which includes the relationship between variables: No. of Trades, Sessions, Traded Value, Traded Stock, Number of days a year, Number of sectors, and is formulated as follows:

$$FBMM = \frac{\left(\frac{T}{S} \times \frac{TV}{TS}\right)}{t}$$

Where (FBMM) is a financial behavior measurement model, (T) is No. of Trades, (S) are sessions, (TV) is the traded value, (TS) is the traded stock, and (t) is the number of days for Commercial year which is equal (360 days). The FBMM is calculated to detect the financial behavior index, as for calculating the average behavior of the investment sectors in the Iraq Stock Exchange, it is done through the following model:

$$\overline{FBMM} = \frac{\sum FBMM}{n}$$

Where ($\overline{FBMM}$) is the average financial behavior of the sectors, (n) is the number of sectors, In order to reach the financial behavior for the current study, it is necessary to initialization all the variables for the model, including table 2 trading volume in the Iraq Stock Exchange during the study period, from (2004 to 2020).

In deriving the financial behavior measurement model, were determining the following assumptions:

1.   Any investor can identify the strong market sectors in which to trade.

2.   The financial behavior measurement model is based on technical analysis of financial market indicators.

3.   The behavior of investors depends on the strength of the sector in which the investment is made.

RESULTS & DISCUSSION

This research is addressed to investors in the Iraq Stock Exchange of a total of 7 financial sectors from which the data were collected. It includes Banks, Insurance, Investment, Services, Industry, Tourism, and Agriculture. The telecommunications sector and the financial

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transfer sector were excluded for their recent accession to the financial market, which may affect the accuracy of the results that are reached.

This study used financial analysis according to the proposed model for measuring the financial behavior of investors to test its main hypothesis that points out; **the financial behavior measurement model can give investors a clear performance of the financial markets**. Table (2) shows the results of the financial behavior of investors in the Iraqi market for securities during the period of the study; While Table (3) shows the financial behavior of all sectors by calculating the average value of The FBMM model. Through the results shown in the two tables, we infer that performance of the financial sectors in the market was good in some sectors and bad in others, and after making the intersection between Table (2) and (3), Table (4) emerged, which shows the general performance of the sectors of the Iraq Stock Exchange. To judge the strength or weakness of the sector in the financial market, count on the reciprocal relationship between the financial behavior measurement model for investors and the average achieved by the sector itself is based on the analytical assumptions of model results at the sector level as follows:

$$If\ (FBMM) \geq Average\ FBMM \therefore Strong\ sector\ (Positive\ behavior\ of\ investors)$$
$$If\ (FBMM) \leq Average\ FBMM \therefore Weak\ sector\ (Negative\ behavior\ of\ investors)$$

Table 2: FBMM Results

	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020
Bank	.874	.230	.035	.465	.848	.264	.427	.393	.020	.084	.643	.439	.241	.380	.170	.109	.150
Insur	.015	.016	.016	.002	.002	.007	.011	.063	.032	.011	.012	.014	.005	.013	.002	.014	.003
Inves	.022	.053	.042	.017	.005	.007	.005	.017	.005	.001	.001	.0004	.0003	.0001	.0002	.0003	.0001
Servi	.322	.584	.126	.058	.068	.257	.385	.984	.643	.482	.337	.710	.444	.199	.276	.175	.286
Indus	.290	.196	.549	.176	.138	.453	.300	.625	.630	.593	.289	.413	.378	.407	.574	.563	.082
Touri	.349	.317	.391	.396	.547	.600	.988	.444	.261	.785	.876	.380	.980	.032	.127	.302	.174
Agric	.011	.038	.006	.003	.004	.015	.060	.369	.592	.375	.178	.376	.236	.316	.410	.363	.481

Source: (Prepared by the authors (2023))

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Table 3: FBMM results for sectors

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
All	2.269	1.776	0.452	0.302	0.230	0.943	0.597	0.842	0.740	0.476	0.477	0.476	0.326	0.335	0.366	0.361	0.31

Source: (Prepared by the authors (2023))

The Financial behavior measurement model for investors' index in the Iraq Stock Exchange is shown in detail in the table below. The mean value of the financial behavior measurement model results for all sectors index reach 2.269 in the year 2014. Only the banking, industrial, and tourism sectors achieved acceptable results. As for the rest of the sectors, they have achieved bad results, being less than from financial behavior measurement model average.

Table 4: Describe the financial behavior of investors

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Banks	S	S	S	S	S	S	W	S	S	S	S	W	W	S	W	W	W
Insurance	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Investment	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Services	W	W	W	W	W	W	W	S	W	S	W	S	S	W	W	W	W
Industry	S	S	S	W	W	W	W	W	W	S	W	W	S	S	S	S	S
Tourism	S	S	W	S	S	S	S	S	S	S	S	S	S	S	S	S	W
Agriculture	W	W	W	W	W	W	W	W	W	W	W	W	W	W	S	S	S

Source: (Prepared by the authors (2023))

As a final outcome of the financial behavior model on the financial markets, we see that the tourism sector was the best sector in the circulation and investor demand for it during the study period, except for the year 2006 due to security instability and terrorist events at the time, as well as the year 2020 due to the outbreak of the Corona pandemic. The banking sector ranks second in terms of its quality according to the financial behavior of investors. This sector witnesses weakness in intermittent stages, the first of which was for the period from 2015-2016, which is the period of ISIS occupation of some Iraqi lands, and the second stage was from 2018-2020, a stage in which Iraq suffers from a financial crisis impact on life in general.

The research result indicates that a financial behavior measurement model for investors gives us a clear impression of the financial markets, that how investors feel about their financial sectors will affect their choices and financial behavior and, in particular, to manage their finances successfully. Previously, financial behavior describes financial problems using psychological theories only. Now, according to the results of our study, doubts became possible in rationality the financial behavior of investors as this behavior adopts the concept of herd

theory without any depth knowledge, and the results indicate consistency between the financial data collected and the theoretical basis used to formulate the model.

The theory of rational behavior of investors who always maximize their returns is not sufficient for justifying the market behavior and reaction. The evidence found in our study points to many patterns of financial behavior that are rooted in the behaviors of individuals and are difficult to be dealt with through a standardized scale. Financial behavior measurement model helps to better understand the financial markets by formulating the behavioral model for investors to be efficient in dealing with some obstacles resulting from the behavioral difference.

CONCLUSION

Our model presents a mathematical mechanism through which it is possible to reduce the size of the external biases affecting the behavior of investors when making their investment decision and to rely on quantitative scientific bases by which the target financial sector can be determined which achieves profitability when investing in it. Financial behavior and its measurement are some of the important topics that preoccupied the thinking of financial institutions and investors alike. Financial institutions are interested in it in order to identify the true status of their shares that are traded, and thus achieve profits as a result of the demand for them. As for measuring the financial behavior of investors, it is important as it guides them to the stocks that achieve the highest returns when identifying the trading movement of other investors and the extent of the strength of the sector in which they are invested. The financial behavior models give a vivid picture of actual investor behavior and the unstable factors of the investor behavior in different circumstances. The knowledge about these behaviors can restrain companies from issuing securities that cannot reap the desired benefits. The existence of biases in the financial markets gives an incorrect position to the market. Therefore, investors can make their decisions on self-created principles and it has nothing to do with reality. This can result in quick decision-making and can even have severe impacts on future investment decisions.

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COMPETING INTERESTS

The author has no conflicts of interest to declare that are relevant to the content of this article.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated and/or analyzed during the current study are available in the Figshare repository, http://www.isx-iq.net/isxportal/portal/uploadedFilesList.html?currLanguage=en .

CODE AVAILABILITY

(Not applicable' for that section).

AUTHORS' CONTRIBUTIONS

Analyzed and interpreted all the data, and was a major contributor in writing the manuscript.

REFERENCES

Andarsari, P. R., & Ningtyas, M. N. (2019). The Role of Financial Literacy on Financial Behavior. *Journal of Accounting and Business Education, 4*, pp. 24-33. doi:http://dx.doi.org/10.26675/jabe.v4i1.8524

Angulo-Ruiz, F., & Pergelova, A. (2015). An Empowerment Model of Youth Financial Behavior. *Journal of Consumer Affairs, 49*, pp. 550-575. doi:10.1111/joca.12086

Arofah, A. A., Purwaningsih, Y., & Indriayu, M. (2018). Financial Literacy, Materialism and Financial Behavior. *International Journal of Multicultural and Multireligious Understanding, 5*, pp. 370-378. Retrieved from http://dx.doi.org/10.18415/ijmmu.v5i4.171

Al_Duhaidahawi, H. M. K., Abdulreza, J. Z. S., Sebai, M., & Harjan, S. A. (2020). An efficient model for financial risks assessment based on artificial neural networks. Journal of Southwest Jiaotong University, 55(3).

Intern. Journal of Profess. Bus. Review. | Miami, v. 8 | n. 5 | p. 01-14 | e01417 | 2023.

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Al-Karawi, A. M. B., & Almashhadani, A. N. (2022). The Impact of Coronavirus Pandemic on the Iraqi Economy. International Journal of Professional Business Review, 7(5), e0705-e0705.

Almshabbak, A. N. S., & Chouaibi, J. (2023). Measuring the Level of Voluntary Disclosure in Commercial Banks and its Effect on Improving Financial Performance: an Applied Study on Number of Commercial Banks in the Iraqi Stock Exchange. International Journal of Professional Business Review, 8(1), e0927-e0927.

Dahl, A. L. (2012). Achievements and gaps in indicators for sustainability. Ecological indicators, 17, 14-19.

Dinga, E., Pop, N., Dimitriu, M., & Milea, C. (2011). Modeling the Financial Behavior of Population (I) – Conceptual Assignations. *Journal of Economic Forecasting, 3*, pp. 239-254. Retrieved from http://www.ipe.ro/rjef/rjef3_11/rjef3_2011p239-254.pdf

Fiksenbaum, L., Marjanovic, Z., & Greenglass, E. (2017). Financial Threat and Individuals' Willingness to Change Financial Behavior. *Review of Behavioral Finance, 9*, pp. 128-147. doi:10.1108/RBF-09-2016-0056

Gorshkova, N. V., & Ksenda, V. M. (2020). Models of Financial Behavior of the Population in the Conditions of Nanoeconomics (Tax Aspect). *Vestnik Volgogradskogo gosudarstvennogo universiteta Ekonomika, 21*, pp. 207-218. doi:10.15688/ek.jvolsu.2019.4.20

Iramania, R., & Lutfia, L. (2021). An integrated model of financial well-being: The role of financial behavior. *Accounting, 7*, pp. 691–700. doi:10.5267/j.ac.2020.12.007

Lovric, M., Kaymak, U., & Spronk, J. (2008). A Conceptual Model of Investor Behavior. *ERIM Report Series Reference, ERS-2008-030*, pp. 1-52. Retrieved from https://ssrn.com/abstract=1144293

Meliza, J., Sadalia, I., & Fachrudin, K. A. (2013). The financial behavior of Investors using discriminant analysis approach. *Journal of Management and Business, 12*, pp. 216-226. doi:https://doi.org/10.24123/jmb.v12i2.20

Nivorozhkina, L. I., Toropova, T. V., Yarashanova, E. U., & Batashev, R. V. (2015). Modeling of Financial Behavior of the Population. *Mediterranean Journal of Social Sciences, 6*, pp. 337-348. doi:10.5901/mjss.2015.v6n3s3p337

Nouri, B. A., Motamedi, S., & Soltani, M. (2017). Empirical Analysis of the Financial Behavior of Investors with Brand Approach (Case Study: Tehran Stock Exchange). *Scientific Annals of Economics and Business, 64*, pp. 97-121. doi:10.1515/saeb-2017-0007

Ramalho, T. B., & Forte, D. (2019). Financial literacy in Brazil – do knowledge and self-confidence relate with behavior? *RAUSP Management Journal, 54*, pp. 77-95. doi:10.1108/RAUSP-04-2018-0008

Rezaei, N., & Elmi, Z. (2018). Behavioral Finance Models and Behavioural Biases in Stock Price Forecasting. *Advances in mathematical finance & applications, 3*, pp. 67-82. doi:10.22034/AMFA.2019.576127.1118

Intern. Journal of Profess. Bus. Review. | Miami, v. 8 | n. 5 | p. 01-14 | e01417 | 2023.

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Rezaei, Z. (2013). The study of behavioral financial effect on individual investment. *European Online Journal of Natural and Social Sciences, 2*, pp. 232-236. Retrieved from https://european-science.com/eojnss/article/view/367/pdf

Robin, T., & Bierlaire, M. (2012). Modeling investor behavior. *Journal of Choice Modelling, 5*, pp. 98-130. doi:https://doi.org/10.1016/S1755-5345(13)70054-X

Selvaraj, S. N., Shamina, H., & Dhanya, C. (2011). An Analysis of financial behavior of investors in mutual fund investment. *Conference: Emerging Trends in Global BusinessAt, 1*, pp. 1-13. Retrieved from https://www.researchgate.net/publication/314064024_AN_ANALYSIS_OF_FINANCIAL_BEHAVIOR_OF_INVESTORS_IN_MUTUAL_FUND_INVESTMENT

Shkvarchuk, L., & Slav'yuk, R. (2019). The Financial Behavior of Households in Ukraine. *ournal of Competitiveness, 11*, pp. 144-159. doi:https://doi.org/10.7441/joc.2019.03.09

Shakatreh, M., Moh'd Ahmad Mansour, A., & Alatyat, Z. A. (2022). Corporate Tax Features in Jordan Affecting Business Decisions: Strengthening Finance Accountability in Emerging Economies. International Journal of Professional Business Review, 7(4), e0739-e0739

Tauni, M. Z., Fang, H. X., & Iqbal, A. (2016). Information Sources and Trading Behavior: Does Investor Personality Matter? *Qualitative Research in Financial Markets, 8*, pp. 94 - 117. doi:http://dx.doi.org/10.1108/QRFM-08-2015-0031

Ueda, M. J. (2017). The evolution of potential VAT revenues and C-efficiency in advanced economies. International Monetary Fund.

Xiao, J. J., & Porto, N. (2019). Present Bias and Financial Behavior. *Financial Planning Review, 2*, pp. 1-30. doi:https://dx.doi.org/10.2139/ssrn.3257093

Zahera, S. A., & Bansal, R. (2018). Do investors exhibit behavioral biases in investment decision-making? A systematic review. *Qualitative Research in Financial Markets, 10*, pp. 210-251. doi:https://doi.org/10.1108/QRFM-04-2017-0028

ABBREVIATIONS

FBMM: Financial behavior measurement model.

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