CAN FINANCIAL LITERACY DRIVE ACTIVE INVESTMENT STRATEGY? EVIDENCE FROM UNDERDEVELOPED CAPITAL MARKET

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Abstract
The main goal of this paper is to determine the empirically analyse the relationship between financial literacy and investment strategy of individual investors from the underdeveloped capital market of Bosnia and Herzegovina. The OECD INFE Core Questionnaire (2011) was mainly used for measuring financial literacy. Using the purposive sampling technique, 89 individual investors were selected. The research was conducted in Bosnia and Herzegovina during the third quarter of 2019. To gain a better understanding of the relationship between entrepreneurs' financial literacy and their decision making styles we primarily use structural equation modeling. The research findings have revealed a statistically - significant impact of financial attitudes, financial behaviour and financial knowledge on active investment strategy. Findings suggest that active investment approach may be raised via enhancing the financial literacy of the investors. Therefore, these results may produce useful pieces of information which might be helpful in the creation of tailored-made training programs which would meet the needs of investors in Bosnia and Herzegovina.

Key words: *financial literacy; investment strategy; underdeveloped capital market.*

JEL Classification: *C3, C83, G40*

I. INTRODUCTION

It has been confirmed by Van Rooij, Lusardi and Alessie (2011) that financial decision making is affected by an individual's level of financial literacy since individuals labelled as low literate are less likely to invest in stocks and therefore are less likely to participate in the stock market. To date, a considerable body of research has sought to understand the concept of financial literacy and its connection to stock market participation in general (Van Rooij, Lusardi & Alessi, 2011; Rashmi & Leena, 2017; Zhong & Zhengwei, 2017; Kadoya, Mostafa & Naheed, 2017; Arts, 2018; Hong, Kubik & Stein, 2004; Georgarakos & Pasini, 2011; Almenberg & Dreber, 2015, Balloch, Nicolae & Philip, 2014, *etc*). However, when it comes to examining the relationship between financial literacy and investment strategy in the case of individual investors from underdeveloped capital markets, there is a certain research gap. In that respect, this study should result in responses to the following question: Does the financial literacy of individual investors have an impact on their investment strategy? The main goal of this paper is to determine the empirically analyse the relationship between financial literacy and investment strategy of individual investors from the underdeveloped capital market of Bosnia and Herzegovina (BiH). Having in mind the above said, the central research hypothesis shall be as follows: Investment strategy of individual investors is driven by their financial literacy. A possible limitation of this study is the small sample that limits the generalization of the findings. Also, another limitation is the possible presence of endogeneity which, in the context of financial literacy, has already been recognized in the research of many others (Van Rooij, Lusardi & Alessi (2011); Van Rooij, Kool & Prast (2007), *etc*.).

The paper is organized as follows. After the introduction, part two gives a short overview of the theoretical framework that is relevant to the main objective of the paper. Part three outlines the data and research methodology. Part four is the centre of the paper and contains analysis and discussion of the original empirical results. The last part contains some final remarks and conclusions.

II. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

In recent literature, evidence of the relationship between financial literacy and stock market participation, in general, can be found. In that respect, Van Rooij, Lusardi and Alessi (2011) found that financial literacy affects financial decision-making, in a way that those with low literacy are much less likely to invest in stocks. Rashmi and Leena (2017) concluded that there is an association between financial literacy and stock market participation. Looking at the households as investors, Zhong and Zhengwei (2017) suggested that the households with higher financial literacy had a better chance of receiving a positive investment return, suggesting that higher financial literacy may result in a better financial outcome. Million and Durga (2018) examined the relationship between financial literacy of salaried employees and their preference towards various investment avenues. Interestingly, Kadoya, Mostafa and Naheed (2017) have shown that financial literacy significantly improves stock market participation even after controlling the demographic, socio-economic, and psychological factors. In

that respect, it is important to say, as pointed out by Arts (2018), that in addition to financial literacy, academic literature discusses other individual characteristics influencing stock market participation, which social interaction (Hong, Kubik & Stein, 2004), trust (Balloch, Nicolae & Philip, 2014) and sociability (Georgarakos & Pasini, 2011) and gender (Almenberg & Dreber, 2015). The central issue addressed in this paper is the relationship between investors' financial literacy and their investment strategy. The theoretical concept is presented in Figure 1.
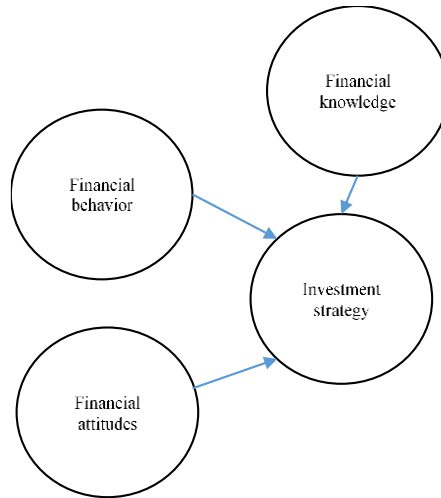

Figure 1. Theoretical concept
Source: Authors' own work

According to Huston (2010), it seems that a large body of financial literacy literature has been lacking in defining the concept of financial literacy. However, in this research, we will use the definition given by the OECD INFE (2011) and Atkinson and Messy (2012), where the financial literacy is defined as a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing. Besides financial literacy, the second variable of interest in this research is an investment strategy that can have two shapes, *i.e.* passive and active. As pointed out by Bodie, Kane and Marcus (2018) while a passive investment strategy takes market prices of securities as set fairly, an active investment strategy attempts to achieve returns greater than those commensurate with the risk borne.

III. METHODOLOGY

Research site

This research is conducted focusing on the analysis of the investors who are trading on the underdeveloped capital market of BiH. This capital market is characterised by territorial division, the incompatibility of entity institutions and legal regulations which negatively affect the investment climate and the liquidity of securities (Zahirović & Okičić, 2016, p. 346). The capital market of BiH consists of two independent territorial regions that have separate stock exchanges, *i.e.*, the Sarajevo Stock Exchange (SASE) which operates in the Federation of Bosnia and Herzegovina and the Banja Luka Stock Exchange (BLSE) which operates in the Republika Srpska. MSCI Inc. (2019a) provides an evaluation of the four market accessibility criteria, as follows: (1) openness to foreign ownership; (2) ease of capital inflows/outflows; (3) efficiency of the operational framework; (4) availability of investment instruments, and (4) stability of the institutional framework. According to these criteria, the capital market of Bosnia and Herzegovina is characterised as the so-called standalone market. Based on the MSCI Global Market Accessibility Review (2019b) currently, in BiH, there is no offshore currency market. Not all regulations can be found in English and financial system is quite fragmented as the country remains to have two semi-autonomous political entities, the judicial system and stock exchange. Stock market information, including dividend information, is often not complete and is not always disclosed in English. There is a very limited level of competition among brokers which can lead to high trading costs. In-kind transfers and off-exchange transactions are prohibited.

Data

This research builds on existing knowledge in the fields of investment strategy and assessing the level of financial literacy. The instrument used for measuring financial literacy (financial knowledge, financial attitude and financial behaviour) was mainly based on the OECD INFE Core Questionnaire (2011) and some previous work of Atkinson and Messy (2011, 2012) as well as Lusardi and Mitchell (2011a, 2011b). We used a snowball sampling technique where participants are recruited by e-mail. The main criterion for the participant selection

was experience with investing in the capital market. Contacts who decided to take part in the survey were asked to forward the request to their colleagues. Participation in the study was voluntary and anonymous. 89% of the distributed questionnaires (out of 100) were returned. The research was conducted during the third quarter of 2019. Table 1 gives an overview of some basic characteristics of the sample.

Table 1. Overview of basic characteristics of the sample

Characteristic		Frequency	Per cent
Sex	Male	72	80.9
	Female	17	19.1
Investing experience	Less than 1 year	11	12.4
	From 1 to 2 years	20	22.5
	From 2 to 5 years	23	25.8
	More than 5 years	35	39.3
Current value of investment portfolio	Less than 2.500,00 €	27	30.7
	From 2.501,00 to 5.000,00 €	30	34.1
	From 5.001,00 to 25.000,00 €	17	19.3
	More than 25.000,00 €	14	15.9
Marketplace	Banja Luka Stock Exchange	24	27.0
	Sarajevo Stock Exchange	47	52.8
	Both	18	20.2

Source: Authors' own work

The majority of investors, from the sample, are male. Most of the investors from the sample have more than five years of investment experience. Furthermore, the most frequent current value of the investment portfolio is between 2.501,00 and 5.000,00 euros. Given the fact that frontier capital market of Bosnia and Herzegovina has many specificities it is not surprising that only 20.2 % of investors from the sample are trading on both stock exchanges, *i.e.* Banja Luka Stock Exchange and Sarajevo Stock Exchange.

Variables

In this research following variables were used: active investment strategy, financial attitudes, financial behaviour and financial knowledge. Having in mind that the underdeveloped capital market of BiH isn't weak-form efficient (Okičić, 2010, 2015) focus is on active, not a passive investment strategy. Table 2 shows all variables used in each scale, with the respective means, and standard deviations. It is important to highlight that the scales used in this study are five-point Likert scales.

Table 2. Scales used, variables, means and standard deviations

LATENT VARIABLE	CODE	ITEM	MEAN	ST. DEV.
ACTIVE INVESTMENT STRATEGY	AIS1	*I OFTEN RESTRUCTURE MY PORTFOLIO.*	2.99	1.13
	AIS2	*I START MANAGING MY STOCK PORTFOLIO BY LOOKING AT THE GENERAL STATE OF THE ECONOMIC SYSTEM AND PREDICTING ITS STATUS IN THE NEAR.*	3.49	1.06
	AIS3	*USING FINANCIAL ANALYSIS TECHNIQUES, I TEND TO FIND THOSE STOCKS THAT HAVE THE DESIRED CHARACTERISTICS.*	3.50	1.06
	AIS4	*VERY RARELY DO I RESTRUCTURE MY PORTFOLIO.**	3.02	1.11
	AIS5	*I BUY SHARES ON THE BASIS OF A CERTAIN CRITERION AND KEEP THE PORTFOLIO CREATED IN THIS WAY UNCHANGED FOR A CERTAIN PERIOD.**	3.46	1.05
	AIS6	*WHEN CREATING A PORTFOLIO, I INVEST IN THE SAME STOCKS THAT ARE CONTAINED IN A PARTICULAR MARKET INDEX, SO THAT THE EQUITY SHARES IN MY PORTFOLIO ARE IDENTICAL TO THEIR PARTICIPATION IN A SPECIFIC MARKET INDEX.**	3.06	1.03
	AIS7	*I ACTIVELY BUY SECURITIES BASED ON THE INFORMATION AVAILABLE AND DISCOVER WHICH SECURITIES ARE OVERVALUED AND WHICH UNDERVALUED*	3.26	1.18
	AIS8	*I SPEND MOST OF MY TIME ANALYZING A WIDE RANGE*	3.20	1.19

		OF INFORMATION, TRYING TO DISCOVER SECURITIES WITH EXTRA YIELD		
	AIS9	*I AM CONSTANTLY REBALANCING MY PORTFOLIO OF SECURITIES BASED ON ANALYZES AND ESTIMATES*	*3.13*	*1.18*
FINANCIAL ATTITUDES	*FA1*	*I CONSIDER MYSELF A FRUGAL PERSON.*	*3.79*	*0.92*
	FA2	*I FIND IT NECESSARY TO LIVE TODAY WITHOUT BOTHERING TOO MUCH WITH TOMORROW.*	*3.43*	*0.99*
	FA3	*I FEEL THAT I SHOULD DO MY BEST TO SUPPORT MY FAMILY A BETTER LIFE.**	*3.85*	*0.87*
	FA4	I am more satisfied when I spend money than when I save it.	*2.93*	*0.82*
	FA5	The money is there to be spent.	*3.03*	*0.87*
	FA6	I think I should live for today and not think about tomorrow.	*3.59*	*0.93*
	FA7	I'm ready to risk my own money.	*2.85*	*1.09*
FINANCIAL BEHAVIOUR	*FB1*	*I'M LEAVING MONEY ASIDE FOR SAVINGS.*	*3.39*	*0.79*
	FB2	*I STICK TO MY WEEKLY AND MONTHLY BUDGET.*	*3.62*	*0.95*
	FB3	*BEFORE BUYING, I CAREFULLY CONSIDER WHETHER I CAN AFFORD IT.*	*4.08*	*0.84*
	FB4	*I SETTLE MY OBLIGATIONS ON TIME.*	*4.55*	*0.65*
	FB5	*I TAKE CARE OF MY PERSONAL FINANCES.*	*4.53*	*0.66*
	FB6	*I SET LONG-TERM FINANCIAL GOALS AND STRIVE TO ACHIEVE THEM.*	*4.33*	*0.64*

Note: * - reverse coded item

Source: Authors' own work

When it comes to financial knowledge, as the third component of financial literacy, it was operationalized by the financial knowledge score (FKS) created by summarizing the number of correct answers on the financial literacy test.

This test contained the usual questions, adapted from Lusardi and Mitchell (2011b), OECD INFE Core Questionnaire (2011), *OKIČIĆ AND SELIMOVIĆ (2017) AND* Okičić (2019), for assessing financial knowledge. Four questions are related to the concept of the time value of money (Is EUR 1,000.00 available today worth more than the EUR 1,000.00 tomorrow? (FK1); Suppose you put EUR 100.00 into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made? (FK5); … and how much would be in the account at the end of five years? (FK6); Imagine that the interest rate on your savings account is 1 per cent a year and inflation is 2 per cent a year. After one year, would the money in the account buy more than it does today, exactly the same or less than today? (FK7)). Three questions are related to the general stock market literacy (Is it usually possible to reduce the risk of investing in the stock market by portfolio diversification? (FK2); Is an investment with a high return likely to be high risk? (FK3); Is it true that bonds have an inverse relationship to interest rates; when interest rates rise, bond prices fall, and *vice-versa*? (FK8). One question refers to general consumer knowledge (Does the high inflation mean that the cost of living is increasing rapidly? (FK4)).

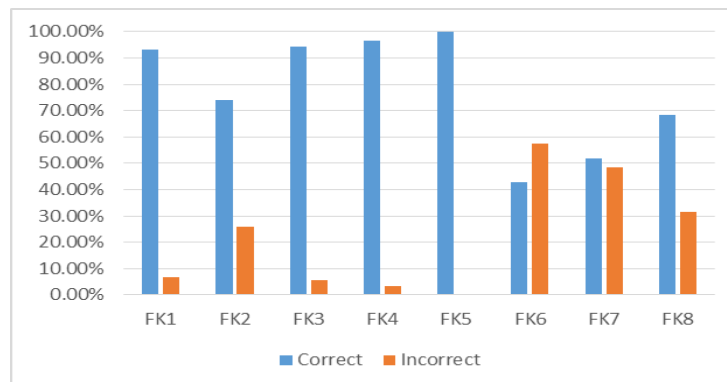Distribution of correct and incorrect answers is presented in the following figure.

Figure 2. The distribution of correct and incorrect answers on the financial knowledge test
Source: Author's own work

Interestingly, looking at the distribution of the FKS it can be noticed that the worst knowledge is in the case of FK6, FK7, FK8. This is important to notice because the understanding time value of money and the

relationship between bonds and interest rates are very important when it comes to financial decision-making. Furthermore, and as pointed out by Van Rooij, Lusardi and Alessie (2011) financial decision making is affected by an individual's level of financial literacy since individuals labelled as low literate are less likely to invest in stocks and therefore are less likely to participate in the stock market. Summa summarum, the conflict between knowledge and investors` confidence leads them to the wrong prediction of investment and the dependency on rumours on their investment decisions (Hossen & Nazmul, 2014, p. 192).

Methods

To gain a better understanding of the relationship between investors' financial literacy and their investment strategy we primarily use multiple linear regression analysis and structural equation modelling. Equation of the proposed model is:

$$AIS = \alpha + \beta_1 FA + \beta_2 FB + \beta_3 FKS + \varepsilon_{AIS}$$

In the previous model, *AIS* is an active investment strategy, *FA* refers to financial attitude; *FB* to financial behaviour, and *FKS* is financial knowledge score. To estimate the model, we used regression analyses and structural equation modelling procedures using STATA version 13.

Instrument validity

Before going any further with the analysis, it is necessary to conduct a reliability analysis, *i.e.* to examine the reliability of used instruments. To see how well selected instruments measure what they really should, we used Cronbach's alpha, α (or coefficient alpha) which is a measure of reliability that ranges from 0 to 1, with values of .60 to .70 deemed the lower limit of acceptability (Hair, Black, Babin & Anderson, 2014). Cronbach's alpha is sensitive to the number of items in a scale. So, a larger number of items can result in a larger, and a smaller number of items in a smaller Cronbach's alpha. The scores, used in multiple linear regression model, for each subscale were calculated as the total score for the items representing each dimension, *i.e.* active investment strategy, financial attitudes and financial behaviour. However, before calculating the scores we assessed whether the subscales had satisfactory reliability (Table 3).

Table 3. Scale statistics

Measure	N	Number of items	Cronbach's Alpha
Active investment strategy	89	9	0.8245
Financial attitude	89	6	0.7353
Financial behaviour	89	6	0.7797

Source: Author's own work

All subscales had acceptable levels of reliability. For construction and validation of the latent variables, confirmatory factor analysis was used. The convergent validity of each latent variable is assessed by observing the following fit indices of the model: root mean square error of approximation (RMSEA), comparative fit index (CFI) and Tucker–Lewis index (TLI) and standardized root mean squared residual (SRMR). Table 4 illustrates the results of the validation of latent variables.

Table 4. Validation of latent variables

LATENT VARIABLE	INITIAL ITEMS	FINAL ITEMS	ADJUSTMENT INDEX
ACTIVE INVESTMENT STRATEGY	AIS1, AIS2, AIS3, AIS4, AIS5, AIS6, AIS7, AIS8, AIS9	AIS2, AIS3, AIS8	$RMSEA = 0.000$, $CFI = 1.000$, $TLI = 1.000$, $SRMR = 0.000$
FINANCIAL ATTITUDES	FA1, FA2, FA3, FA4, FA5, FA6, FA7	FA1, FA2, FA5	$RMSEA = 0.000$, $CFI = 1.000$, $TLI = 1.086$, $SRMR = 0.012$
FINANCIAL BEHAVIOR	FB1, FB2, FB3, FB4, FB5, FB6	FB1, FB3, FB6	$RMSEA = 0.000$, $CFI = 1.000$, $TLI = 1.000$, $SRMR = 0.000$

Source: Authors' own work

It has been suggested that RMSEA values less than 0.05 are good, values between 0.05 and 0.08 are acceptable, values between 0.08 and 0.1 are marginal, and values greater than 0.1 are poor (Fabrigar *et al*., 1999). The CFI value close to 0.90, and TLI over 0.90, show a relatively good fit (Bentler, 1990). When it comes to SRMR, a value less than 0.08 is generally considered a good fit (Hu & Bentler, 1999). Results presented in Table 3 are suggesting a good model fit.

IV. EMPIRICAL RESULTS AND DISCUSSION

According to the empirically assessed, previously mentioned, financial knowledge score (M = 6.16, Mdn = 6.00, SD = 1.02), we have identified two categories of investors, i.e. category of investors with average and below average (maximum 6 correct answers) and above average (more than 6 correct answers) financial knowledge. 57.3% of investors from the sample had an average or below-average financial knowledge score, while the other 42.7% had above-average financial knowledge score. An independent-samples t-test was conducted to compare the active investment strategy score in different financial knowledge categories. There was a significant difference in the active investment strategy score for financial knowledge score level 1 (M= 9.725, SD= 0.389) and financial knowledge score level 2 (M=10.857, SD=0.377) conditions; t(84)=-2.007, p = 0.048. Furthermore, a multiple regression was conducted to evaluate whether financial attitudes, financial behaviour and financial knowledge were necessary to predict active investment strategy. Multiple regression analysis was used to test if financial attitudes, financial behaviour and financial knowledge significantly predicted investors' active investment strategy score. The results of the regression indicated the three predictors explained 33.13% of the variance ($R2=.3313$, $F(3,82)=13.54$, $p<.01$). It was found that financial attitudes significantly predicted active investment score ($\beta\_1=-0.242,p=0.003$), as did financial behavior ($\beta\_2=0.832,p=0.000$). Next step in the analysis is to test the relationship between financial literacy and investment strategy by using structural equation modelling. The final model obtained after modification is shown in Figure 3.
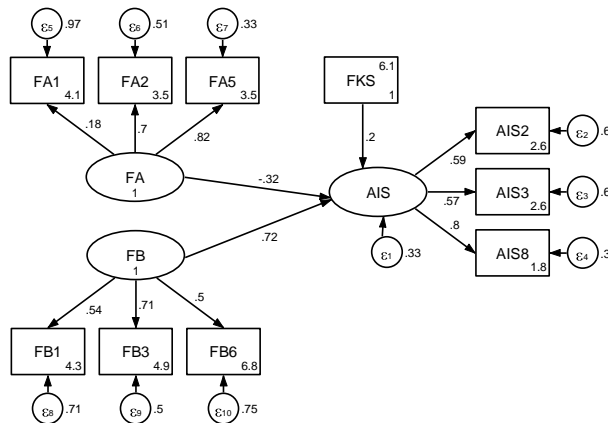

Figure 3. The final model
Source: Authors' own work

Next, Table 5 illustrates the significance of relations of the final proposed model, as well as fit indices.

Table 5. Significance of relations of the final proposed model and fit indices

HYPOTHESIS	STANDARDIZED PARAMETERS			R2	FIT INDICES			
	B_1	SE	P-VALUE		RMSEA	CFI	TLI	SRMR
	-0.322	0.122	0.008					
H_1	B_2	SE	P-VALUE	0.666	0.032	0.979	0.972	0.067
	0.722	0.125	0.000					
	B_3	SE	P-VALUE					
	0.201	0.106	0.058					

Source: Authors' own work

Results presented in Table 5 are suggesting a good model fit. *BASED ON THE RESULTS PRESENTED IN TABLE 5, IT IS REASONABLE TO CLAIM THE STATISTICALLY SIGNIFICANT IMPACT OF FINANCIAL ATTITUDES, FINANCIAL BEHAVIOUR AND FINANCIAL KNOWLEDGE ON ACTIVE INVESTMENT STRATEGY. HAVING IN MIND THAT THE CAPITAL MARKET OF BIH IS NOT EVEN WEAK-FORM EFFICIENT (OKIČIĆ, 2015) IT MAY BE CONCLUDED THAT ACTIVE INVESTMENT STRATEGY OF* individual investors may be driven by their financial literacy

V. CONCLUSION

In the investment decision-making process, individual investors are faced with very complex factors, and it is important, well, to identify all the confusing variables that drive them to make the right decision, as this can avoid or reduce losses in the future. The results of the study suggest that financial literacy has a positive and statistically significant impact on the investment strategy of individual investors who trade on BiH capital market. Interestingly, not only financial attitudes and behavior, but also financial knowledge affects the investment strategy of investors. This means that, by increasing the level of knowledge in financial literacy and increasing the ability to analyze financial information, an individual investor can enhance capacity building in risky investments to generate high returns through efficient investment management. Financial literacy, which is also related to knowledge of factors such as understanding the value of money and the relationship between bonds and interest rates, is very important when it comes to financial decision making because analyzing these factors also helps to make the right decisions. Our research proved valuable because it explored this impact as well. Moreover, for investors, this research is useful when obtaining financial information to be aware of how much knowledge they need to cope with a risky situation. In BiH, little attention has been paid to identifying factors that influence the decision-making process. A greater understanding of key financial concepts by individual investors is needed to understand and evaluate the choices available to them. Individual investor education and financial literacy programs in BiH could help improve financial performance and key benefits would include more informed investment decision making, better financial planning, greater confidence and greater participation in the securities markets. It should be borne in mind that a quality education program for individual investors can help investors to better evaluate adequate and quality investment advice when it comes to investment products and services. The popularity of active investment strategies comes with improved financial skills and knowledge, which implies an increase in confidence in the financial sector in BiH and an increased likelihood that investors will participate in the securities markets. Ultimately, the result would be to raise the inactive capital that characterizes the financial sector in Bosnia and Herzegovina and thus to promote greater market efficiency. Financial literacy proves to be an important determinant, while further research is needed to explore further dimensions such as the impact of the investment experience. In addition, other variables such as risk-adjusted performance, securities analysis performance, and investment motives may be included to investigate their impact on investment decisions. Due to the economic and political instability of BiH, the results may vary in the context of other economies that have different economic and political conditions.

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