



THE ROLE OF OVERCONFIDENCE AND PAST INVESTMENT EXPERIENCE IN HERDING BEHAVIOUR WITH A MODERATING EFFECT OF FINANCIAL LITERACY: EVIDENCE FROM PAKISTAN STOCK EXCHANGE



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ABSTRACT

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The most stimulating task for investors is to make rational investment decisions. Normally, investors indulge in behavioural biases in uncertain situations. Numerous cognitive factors influence investors during decision making for investment and lead towards herding the acts of others. The core objective of this study is to investigate the influence of overconfidence and past investment experience on the herding behaviour of individual investors participating in the Pakistan stock exchange. To accomplish this aim, researcher used a quantitative research method and a cross-sectional research design. Data was collected from 352 individual investors participating in Pakistan stock exchange via survey questionnaires. A partial least square (PLS) was used to assess the measurement model and structural equation model. Additionally, the study examines the moderating effect of financial literacy on the relationship of overconfidence and past investment experience with the herding behaviour of individual investors. The results provided strong evidence that both overconfidence and past investment experience motivate investors towards herding behaviour. It was found that financial literacy has a moderate impact on the relationship between the cognitive profile and herding behaviour. This study contributes to behavioural finance literature and provides empirical evidence that the cognitive factors of investors are significant predictors of herding behaviour of investors. The study offers new empirical insights of investors' behaviour due to the cognitive characteristics in Pakistan stock market.

Contribution/ Originality: This study is a pioneer study that examines the influence of financial literacy on the relationship of overconfidence and past investment experience with herding behaviour of investors participating in Pakistan stock exchange. This study's results would help in policy making and in improving the decision making process for investors.

1. INTRODUCTION

Anomalies in stock markets are of interest to economists in finance and other sectors. These anomalies appear due to behavioural and cognitive biases and result in irrational investment decisions. Behavioural biases have a significant impact on behaviour of stock market investors (Kumar and Goyal, 2016). Evidence from the literature

shows that overconfidence and past investment experience not only affects the behaviour of individual investors (Spyrou, 2013) but it also influences investment decisions (Hoffmann *et al.*, 2013).

Investors make investment decisions in uncertain and risky situation. Traditional finance (such as stated in the Efficient Market Hypothesis) argues that information on different investment prospects is equally accessible for all investors and that investors explain the information in a rational manner. However, stock markets are uncertain and due to uncertainty, investors herd the actions of others and make investment decisions on the basis of others' actions (Fernández *et al.*, 2011).

Herding appears in the stock market when many investors concurrently replicate the actions of other investors with a lack of knowledge and restricted information (Ngoc, 2014; Kumar and Goyal, 2016). Consequently, investors overlook their personal beliefs and information when they imitate the behaviour of other investors. The herding behaviour of investors moves the trading volume and volatility of market towards their highest levels. Subsequently, this behaviour of investors pushes the stock prices far away from their fair values because of price momentum and excess volatility (Nofsinger and Sias, 1999; Gębka and Wohar, 2013). This market situation creates stock price bubbles.

Literature shows that cognitive factors like overconfidence and past investment experience influence the herding behaviour of investors (Baddeley *et al.*, 2012). According to Fernández *et al.* (2011) overconfident investors are less likely to herd because herding behaviour depends on the degree of confidence. Overconfidence occurs when investors exaggerate their skills and knowledge and overlook the risk connected with each investment (Tan *et al.*, 2012). Psychologists assume that overconfident investors are individuals who overstate their knowledge and skills, understate the risk and overstate their capability to govern and control the events (Glaser *et al.*, 2003; Koehler and Harvey, 2008). However, overconfident investors exaggerate the information collected, overstate their own predictive abilities and ignore the actual facts (Haseeb *et al.*, 2018; Suryanto *et al.*, 2018; Ali and Haseeb, 2019).

Investors' past investment experience also contributes to herding behaviour (Thaler, 2010). The human brain stores good and bad experiences through a process and records different features of the experience. Experience affects the risk taking attitude of investors. Those investors are more likely to become risk takers if they profited from past investments and become risk averse when they have been confronted with financial losses from past investments (Nofsinger, 2005). Bad past performance in investment will lead investors towards herding behaviour (Merli and Roger, 2013). Investors use the results of past investments as a factor for the evaluation of uncertainty in current investments (Nofsinger, 2011). Following unprofitable investments, investors tend to demonstrate a risk adverse attitude, therefore, they indulge in herding behaviour (Nofsinger, 2005).

Past investment experience and overconfidence are vital in shaping the behaviour of individuals and changing the mind-set of investors but financial literacy is also an important element that influences the investors' behaviour. Financial literacy means the knowledge, expertise and skills to make rational financial decisions (Altman, 2012). Financial literacy helps investors understand stock market functions and the behaviour of market participants (Giesler and Veresiu, 2014). Investors who have knowledge of finance could undertake proper analysis and use different procedures at the time of making an investment decision. They gather proper information through different sources like financial publications, news and social media.

On the contrary, investors who have an improper knowledge of finance, rely more on advice from peers, colleagues, and stockbrokers (Al-Tamimi and Kalli, 2009). Individual investors who indulge in herding behaviour in the stock market have insufficient knowledge, and are less confident regarding information or unable to process the information for investment decision making (Fernández *et al.*, 2011). Financial literacy provides knowledge of financial products and services on the market, and improves financial decision-making (Altman, 2012) because financial education and valuable information are the main elements of financial literacy (Lusardi and Mitchell, 2007). Financial literacy also enhances individuals' skills to analyse the information and assist them in making

rational investment decision making (Lusardi and Mitchell, 2014) but it has never been incorporated into an existing comprehensive and well-established psychosocial model. This study aims to fill this gap in the literature.

In a nutshell, the above arguments indicate that cognitive factors have a relationship with herding behaviour which can be moderated with financial literacy. Although numerous elements have been studied in the earlier research, but no previous attempt has been made to examine the impact of financial literacy on the past investment experience and overconfidence affecting the herding behaviour of stock market investors, especially in the context of the Pakistani stock market. Therefore, there is a need to understand the influence of past investment experience and overconfidence on the herding behaviour of investors and how financial literacy moderates the impact of cognitive factors (past investment experience and overconfidence) on the herding behaviour of investors.

According to the authors' knowledge, this is a pioneer study to examine the influence of financial literacy on the relationship of cognitive factors and herding behaviour of investors participating in Pakistan stock exchange. The study's major contribution is to bridge the gap in the behavioural finance literature regarding the influences moderating the cognitive factors of investors impacting herding behaviour. The findings will provide a better understanding of herding behaviour and can help academics and practitioners make policy.

The structure of this paper is as follows. The next part of this paper presents a review of the literature on cognitive factors and the herding behaviour of investors. Section three of this study explains the methodology that is adopted by this study. In section four, the analysis and findings are presented. The last section of this study presents the conclusion.

2. LITERATURE REVIEW

This section of the study presents the empirical and theoretical literature on past investment experience and overconfidence and the impact on the herding behaviour of the stock market's investors. Behavioural finance assumes that emotions and cognitive errors affect the investor's behaviour at the time of making investment decisions. These emotions and cognitive errors can be behavioural biases that influence the behaviour of investors. In the current study, we have tried to describe the relationship between two behavioural biases, namely overconfidence and past investment experience with the herding behaviour of investors.

2.1. Overconfidence and Herding Behaviour

Overconfident investors overstate their abilities and skills to govern and control the events, exaggerate their knowledge and ignore the risk associated with investment (Glaser *et al.*, 2003; Koehler and Harvey, 2008; Tan *et al.*, 2012). Pompian (2006) argued that people vulnerable to prediction overconfidence and those who are affected by overconfidence bias trade too much and maintain un-diversified portfolios. According to Zaidi and Tauni (2012) overconfident investors consider themselves superior to others and this tendency can lead to excessive trade. Chuang and Lee (2006) argued that overconfidence leads investors towards understating the investment related risks, overstating their stock market knowledge and trading excessively which ultimately affects the behaviour of stock market investors. On the other hand, Jain *et al.* (2015) argued that overconfidence has no significant impact on investment decisions. Fernández *et al.* (2011) examined the relationship between cognitive factors and the herding behaviour of investors and concluded that there is a positive association between overconfidence and the herding behaviour of individual investors. Finally, from the above discussion, it is concluded that overconfidence has a relationship with the herding behaviour of investors.

H₁: There is relationship between overconfidence and the herding behaviour of individual investors.

2.2. Past Investment Experience and Herding Behaviour

The human brain records observations of emotional and physical experiences rather than factual recordings of events (Nofsinger, 2005). The human brain memorises the happenings through a process and accumulates different

characteristics of the experience. These stored factors could be used as the basis for future events. With regards to past investment experience, the literature shows that bad past investment experience has positive relationship with the herding behaviour of investors (Merli and Roger, 2013) while Bikhchandani and Sharma (2000) argued that there is no significant relationship between past investment experience and the herding behaviour of investors. Nofsinger (2005) argued that investors use past outcomes to evaluate current investment opportunities, a process also known as past investment experience consideration. After bearing financial losses from investments, investors feel hurt and consequently they avoid risky ventures and therefore, they herd the acts of others. However, investors feel confident and take risks when they have had past good experiences (Nofsinger, 2011). Similarly, Bauchner *et al.* (2000) argued that those investors that have bad experiences and suffered losses from preceding investments are very careful regarding current investment prospects and are risk averse, because they do not want to repeat mistakes. According to Thaler (2010) losses from past investments (snake bite effect) and gains from past investments (past success) affect the behaviour of investors at the time of making investment decisions. In addition, the study states that past investment experiences affect the herding behaviour of stock market investors.

H₂: There is a relationship between past investment experience and the herding behaviour of individual investors.

2.3. Moderating Role of Financial Literacy on the relationship of cognitive factors and Herding Behaviour

Financial literacy is a skill of recognising methods of investing in a systemic way (Giesler and Veresiu, 2014). Investors that are financially literate have less tendencies to indulge in irrational behaviour as compared to others (Borden *et al.*, 2008; Disney and Gathergood, 2013). Financially literate investors use proper techniques at the time of making investment decisions (Al-Tamimi and Kalli, 2009). They ignore improper information and process only relevant information at the time of investment analysis (Jain *et al.*, 2015). Hayat and Anwar (2016) argued that financial knowledge also affects the risk taking capacity of investors because financial literacy declines the risk opposing tendency of individuals and financial knowledge provides multiple approaches for handling risky situations (Almenberg and Dreber, 2015). Less financially literate individuals get confused during financial decision making and indulge in behaviour biases (Disney and Gathergood, 2013). Therefore, financial literacy empowers investors to increase their decision making capability by processing and analysing information properly (Hayat and Anwar, 2016).

H₃: Financial literacy moderates the relationship between overconfidence and the herding behaviour of individual investors.

H₄: Financial literacy moderates the relationship between past investment experience and the herding behaviour of individual investors.

2.4. Research Model

The research model for this study is presented in Figure 1. This model is based on prospect theory and social learning theory. These theories explain that the cognitive factors of individuals affect their behaviour during decision making. Prospect theory describes the ways in which individuals behave at the time of choosing alternative investment opportunities, while social learning theory states that cognitive characteristics shape the behaviour of individuals.

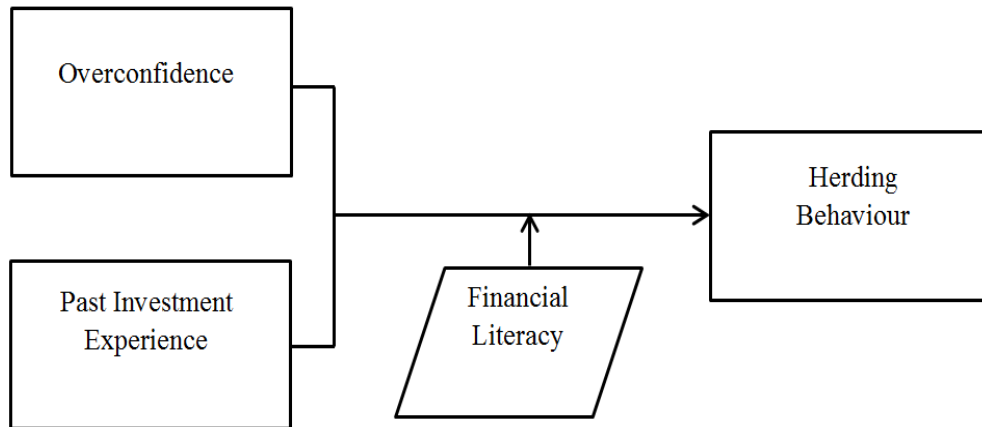


Figure-1. Theoretical Framework.

3. METHODOLOGY

3.1. Sample and Data Collection Method

This study used the quantitative research approach. The study's population contained individual investors investing in the Pakistani stock exchange directly and through brokerage houses. This study used area cluster sampling for respondent selection. To use area cluster sampling, the total population was divided into three clusters (Islamabad, Karachi and Lahore). From the total estimated number of 250,000¹ individual investors participating in the Pakistani stock market, the selection of a total number of 650 individual investors was made and a survey questionnaire was used for the collection of data. Of the 650, only 352 questionnaires were returned (54.15% response rate). Of the 352 questionnaires, twelve survey questionnaires were incomplete and were excluded and only 340 questionnaires were used in the data analysis (52 % actual response rate).

The questionnaire was divided into three sections. The first section of the questionnaire consisted of demographic questions related to the respondents' background. The second section of the questionnaires contained questions related to herding behaviour, overconfidence and past investment experience. The third section contained questions related to financial literacy. All scaled items were adapted from previous studies which validated them in the contexts of developed as well as developing economies. For the purpose of this study, the items for measuring herding behaviour were adapted from the work by [Prosad et al. \(2015\)](#). For overconfidence, the items by [Abdallah and Hilu \(2015\)](#) were adopted. In addition, the items for past investment experience were adapted from the work by [Mouna and Anis \(2015\)](#).

3.2. Empirical Equations

$$HB = \beta_0 + \beta_1(OC) \quad (1)$$

Where,

HB= Herding behaviour (Dependent Variable)

OC= Overconfidence (Independent Variable)

The [Equation 1](#) is estimated with the Partial least squares (PLS) regression. This equation is used to estimate the effect of overconfidence (OC) on the herding behaviour (HB) of individual investors participating in the Pakistan stock exchange.

$$HB = \beta_0 + \beta_1(PIE) \quad (2)$$

Where,

¹ "THE ASSET" Magazine

HB= Herding behaviour (Dependent Variable)

PIE= Past investment experience (Independent Variable)

The Equation 2 is also estimated with the Partial least squares (PLS) regression. This equation is used to estimate the effect of Past investment experience (PIE) on the herding behaviour (HB) of individual investors participating in the Pakistan stock exchange.

$$HB = \beta_0 + \beta_1(OC) + \beta_2(OC)(FL) \quad (3)$$

Where,

HB= Herding behaviour (Dependent Variable)

OC= Overconfidence (Independent Variable)

FL= Financial literacy (Moderating Variable)

The Equation 3 is estimated with the product indicator approach. This approach generates product indicators through producing all potential products from the two sets of indicators. These product terms are used to reflect the latent interaction variable. In Equation 2 the interaction term of overconfidence (OC) and financial literacy (FL) were generated and estimate the moderating effect of financial literacy on the relationship of overconfidence (OC) with the herding behaviour (HB) of individual investors participating in Pakistan stock exchange.

$$HB = \beta_0 + \beta_1(PIE) + \beta_2(PIE)(FL) \quad (4)$$

Where,

HB= Herding behaviour (Dependent Variable)

PIE= Past investment experience (Independent Variable)

FL= Financial literacy (Moderating Variable)

The Equation 4 is also estimated with the product indicator approach. In Equation 4 the interaction term of Past investment experience (PIE) and financial literacy (FL) was generated and estimates the moderating effect of financial literacy on the relationship of past investment experience (PIE) with the herding behaviour (HB) of individual investors participating in Pakistan stock exchange.

This study used the Partial least squares (PLS) regression estimation method. The PLS method reduces the data to small data sets and then performs regression on these data sets, as a substitute for the original data. PLS regression is specifically useful for those data that have highly collinear predictors, or when predictors are more than observations. Ordinary least-squares (OLS) regression is not suitable for this situation because OLS either calculates coefficients with high standard errors or completely fails in estimation. Partial least squares (PLS) regression does not assume that predictors are fixed. This means, predictors can be estimated with error. Therefore, PLS regression is the more suitable method for estimation of data that have uncertainty.

4. DATA ANALYSIS AND RESULTS

Smart-PLS was employed for the assessment of the measurement model and the estimation of the structural model. Figure 2 indicates the results of the assessment of the measurement model.

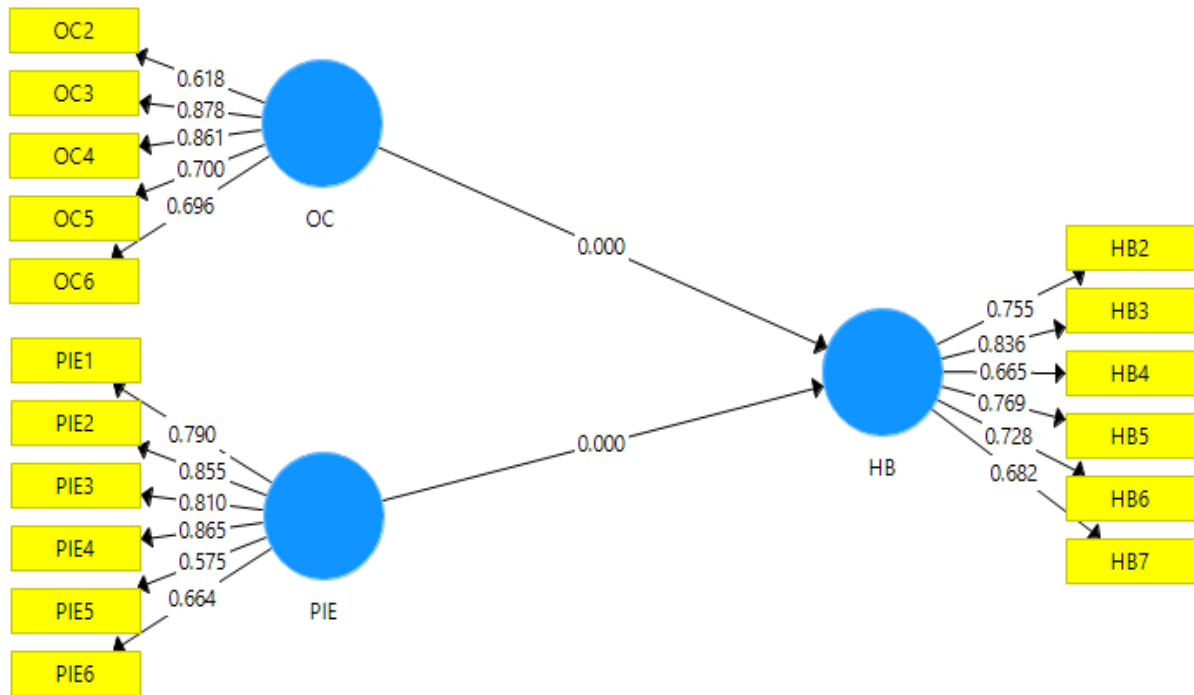


Figure-2. Measurement Model Assessment.

4.1. Measurement Model Assessment

The measurement model examined the validity of the construct. Two types of validity were examined through the measurement model: the first one was the convergent validity and the second one was the discriminant validity.

4.1.1. Confirmatory Factor Analysis

Table 1 presents factor loadings, Cronbach's alpha, CR and AVE that were used to examine the convergent validity of the constructs. According to Hair et al. (2014) the constructs' validity is convergent when the factor loading of items is greater than 0.50, and therefore the item that has factor loading less than 0.50 should be removed. Therefore, the items that had factor loading less than 0.50 were removed from the scale. The convergent validity of variables was assessed by CR and AVE. The value of CR for all variables was greater than 0.80, and any CR having values higher than 0.8, indicated that the convergent validity of all variables had been established.

Table-1. Convergent validity, Cronbach's alpha, Composite Reliability (CR), AVE.

Constructs	Items	Loadings	Cronbach's alpha	CR	AVE
Overconfidence (OC)	OC2	0.618	0.808	0.869	0.574
	OC3	0.878			
	OC4	0.861			
	OC5	0.700			
	OC6	0.682			
Past Investment Experience (PIE)	PIE1	0.790	0.854	0.894	0.588
	PIE2	0.855			
	PIE3	0.810			
	PIE4	0.865			
	PIE5	0.575			
	PIE6	0.664			
Herding Behaviour (HB)	HB2	0.755	0.835	0.879	0.549
	HB3	0.863			
	HB4	0.665			
	HB5	0.769			
	HB6	0.728			
	HB7	0.682			

4.1.2. Discriminant Validity

Table-2. Heterotrait – Monotrait Ratio.

Constructs	FL	HB	OC	PIE
FL				
HB	0.092			
OC	0.146	0.760		
PIE	0.172	0.783	0.832	

FL: Financial literacy, HB: Herding Behaviour, OC: Overconfidence, PIE: Past investment experience.

Table 2 explained the value of the HTMT ratio. The examination of the discriminant validity through the HTMT ratio is an effective method. According to Voorhees *et al.* (2016) the HTMT ratio should be less than 0.85 to confirm the discriminant validity. Values of all ratios are according to threshold values that conform to the discriminant validity of scale.

4.2. Structure Equation Modelling

The structural model was measured through Smart-PLS bootstrapping. Evaluating the structural model includes assessing R^2 , beta and the corresponding t-values (Hair *et al.*, 2014). The bootstrapping process was applied to obtain the direct and moderating effects within the variables (Hair *et al.*, 2014; Soto-Acosta *et al.*, 2016).

4.2.1. Path Modeling

Table-3. Direct Effects.

Hypothesis	Relationship	Std. Beta	S.E.	t-Value	P-Value	Decision
H ₁	OC -> HB	0.381	0.053	7.178	0.000	Supported
H ₂	PIE -> HB	0.387	0.050	7.689	0.000	Supported

The study used the bootstrapping method to measure the significance of path coefficients. Table 3 shows that the results indicate that overconfidence is significantly and positively related to herding behaviour ($\beta = 0.381$, $t = 7.178$) and support H₁. The results also revealed that past investment experience has a significant positive relationship with herding behaviour ($\beta = 0.387$, $t = 7.689$) and support H₂.

Table-4. Moderating effect results.

Hypothesis	Relationship	Std. Beta	S.E.	t-Value	P-Value	Decision
H ₃	OC*FL -> HB	0.186	0.060	3.094	0.002	Moderation
H ₄	PIE*FL -> HB	-0.157	0.063	2.483	0.013	Moderation

The results of the bootstrapping analysis of the indirect effects shown in Table 4 indicated that financial literacy significantly moderates the relationship between overconfidence and herding behaviour ($\beta = 0.186$, $t = 3.094$) supporting H₃. The results also showed that financial literacy moderates the relationship between past investment experience and herding behaviour ($\beta = -0.157$, $t = 2.483$) supporting H₄.

5. FINDINGS

The results showed that overconfidence is significantly positively associated with the herding behaviour of stock market investors with t-value 7.178 and $\beta = 0.381$. It indicated that an increase in overconfidence among the investors increases the herding behaviour of investors. Findings demonstrated that past investment experience also positively affects the herding behaviour of investors with t-value 7.689 and $\beta = 0.387$.

Finally, the contemporary research examined the moderating effect of financial literacy on the relationship of overconfidence and past investment experience with the herding behaviour of stock market investors. It indicated

that financial literacy has moderating effect on the relationship of overconfidence and the herding behaviour of stock market investors with t-value 3.094 and $\beta = 0.186$.

It indicated that financial literacy increases the influence of overconfidence on herding behaviour. Results showed that financial literacy has a moderating role on the relationship of past investment experience and investors' herding behaviour with t-value 2.483 and $\beta = -0.157$. The negative β -value indicated that financial literacy decreases the impact of past investment experience on herding behaviour. Hence, financial literacy has the ability to improve investors' investment decision making via their impact by past investment experience.

6. DISCUSSION AND CONCLUSION

The study aimed to ascertain the elements which contribute towards the herding behaviour of individual stock market investors. This study revealed that there is a positive relationship between overconfidence and the herding behaviour of stock market investors and supported H_1 . These results are consistent with Fernández *et al.* (2011). However, Chuang and Lee (2006) identified that overconfident investors exaggerate information. H_3 of this study examined the moderating effect of financial literacy on the relationship of overconfidence and the herding behaviour of investors and discovered that financial literacy enhanced the effect of overconfidence on herding behaviour. Müller and Weber (2010) argued that financial literacy improves the ability of investors to perform financial analysis, therefore financial literacy gives investors' confidence.

The second hypothesis was to investigate the effect of past investment experience on herding the behaviour of investors. The findings discovered that past investment experience has a positive relationship with herding behaviour and these findings are compatible with Merli and Roger (2013). Finally, financial literacy has a moderating role on the relationship of past investment experience and herding behaviour. It has a negative role and mitigates the herding behaviour of investors, therefore H_4 was accepted.

Several researchers recognize different factors that drive investors toward herding behaviour including overconfidence and past investment experience. Investors indulge in behavioural biases and these biases lead towards irrational investment decisions. This study fills the gap in the literature on the behavioural biases of investors. There is a need to increase the financial literacy of investors. Findings indicated that high and low levels of financial literacy correspond to different levels of intensity of herding behavior among individual investors. Therefore, the cognitive profiles of individual investors prove to be important for determining herding behaviour. It was concluded that there is a dependence association between the cognitive profile of investors and the herding phenomenon. The determinants of herding behavior and financial literacy are interconnected either in a positive or negative relationship. In the presence of financial literacy, past investment experience mitigates herding behaviour.

This study has used only two factors from the cognitive profile for evaluating herding behaviour. Future researchers should use other variables like information availability, uncertainty and attitudes to risk taking.

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REFERENCES

- Abdallah, S. and K. Hilu, 2015. Exploring determinants to explain aspects of individual investors' financial behaviour. *Australasian Accounting, Business and Finance Journal*, 9(2): 4-22. Available at: <https://doi.org/10.14453/aabfj.v9i2.2>.
- Al-Tamimi, H.A. and A.A.B. Kalli, 2009. Financial literacy and investment decisions of UAE investors. *The Journal of Risk Finance*, 10(5): 500-516. Available at: <https://doi.org/10.1108/15265940911001402>.

- Ali, A. and M. Haseeb, 2019. Radio frequency identification (RFID) technology as a strategic tool towards higher performance of supply chain operations in textile and apparel industry of Malaysia. *Uncertain Supply Chain Management*, 7(2): 215-226. Available at: <https://doi.org/10.5267/j.uscm.2018.10.004>.
- Almenberg, J. and A. Dreber, 2015. Gender, stock market participation and financial literacy. *Economics Letters*, 137: 140-142. Available at: <https://doi.org/10.1016/j.econlet.2015.10.009>.
- Altman, M., 2012. Implications of behavioural economics for financial literacy and public policy. *The Journal of Socio-Economics*, 41(5): 677-690. Available at: <https://doi.org/10.1016/j.socec.2012.06.002>.
- Baddeley, M., C. Burke, W. Schultz and P. Tobler, 2012. Herding in financial behaviour: A behavioural and neuroeconomic analysis of individual differences.
- Bauchner, R., H. Weinberger, W.E. Wright and A. Newman, 2000. U.S. Patent No. 6,029,153. Washington, DC: U.S. Patent and Trademark Office.
- Bikhchandani, S. and S. Sharma, 2000. Herd behavior in financial markets. *IMF Staff Papers*, 279-310.
- Borden, L.M., S.-A. Lee, J. Serido and D. Collins, 2008. Changing college students' financial knowledge, attitudes, and behavior through seminar participation. *Journal of Family and Economic Issues*, 29(1): 23-40. Available at: <https://doi.org/10.1007/s10834-007-9087-2>.
- Chuang, W.-I. and B.-S. Lee, 2006. An empirical evaluation of the overconfidence hypothesis. *Journal of Banking & Finance*, 30(9): 2489-2515. Available at: <https://doi.org/10.1016/j.jbankfin.2005.08.007>.
- Disney, R. and J. Gathergood, 2013. Financial literacy and consumer credit portfolios. *Journal of Banking & Finance*, 37(7): 2246-2254. Available at: <https://doi.org/10.1016/j.jbankfin.2013.01.013>.
- Fernández, B., T. Garcia-Merino, R. Mayoral, V. Santos and E. Valledado, 2011. Herding, information uncertainty and investors' cognitive profile. *Qualitative Research in Financial Markets*, 3(1): 7-33. Available at: <https://doi.org/10.1108/17554171111124595>.
- Gębka, B. and M.E. Wohar, 2013. International herding: Does it differ across sectors? *Journal of International Financial Markets, Institutions and Money*, 23: 55-84. Available at: <https://doi.org/10.1016/j.intfin.2012.09.003>.
- Giesler, M. and E. Veresiu, 2014. Creating the responsible consumer: Moralistic governance regimes and consumer subjectivity. *Journal of Consumer Research*, 41(3): 840-857. Available at: <https://doi.org/10.1086/677842>.
- Glaser, M., M. Nöth and M. Weber, 2003. Behavioral finance. Rationality concepts, decision behavior and economic modeling, 3.
- Hair, J.J., M. Sarstedt, L. Hopkins and V. G. Kuppelwieser, 2014. Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review*, 26(2): 106-121. Available at: <https://doi.org/10.1108/ebv-10-2013-0128>.
- Haseeb, M., I.S.Z. Abidin, Q.M.A. Hye and N.H. Hartani, 2018. The impact of renewable energy on economic well-being of Malaysia: Fresh evidence from auto regressive distributed lag bound testing approach. *International Journal of Energy Economics and Policy*, 9(1): 269-275.
- Hayat, A. and M. Anwar, 2016. Impact of behavioral biases on investment decision; moderating role of financial literacy. *SSRN Electronic Journal*: 1-14.
- Hoffmann, A.O., T. Post and J.M. Pennings, 2013. Individual investor perceptions and behavior during the financial crisis. *Journal of Banking & Finance*, 37(1): 60-74. Available at: <https://doi.org/10.1016/j.jbankfin.2012.08.007>.
- Jain, R., P. Jain and C. Jain, 2015. Behavioral biases in the decision making of individual investors. *IUP Journal of Management Research*, 14(3): 7-27.
- Koehler, D.J. and N. Harvey, 2008. *Blackwell handbook of judgment and decision making*. John Wiley & Sons.
- Kumar, S. and N. Goyal, 2016. Evidence on rationality and behavioural biases in investment decision making. *Qualitative Research in Financial Markets*, 8(4): 270-287. Available at: <https://doi.org/10.1108/qrfm-05-2016-0016>.
- Lusardi, A. and O. Mitchell, 2007. The importance of financial literacy: Evidence and implications for financial education programs. *Policy Brief*.

- Lusardi, A. and O.S. Mitchell, 2014. The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1): 5-44. Available at: <https://doi.org/10.1257/jel.52.1.5>.
- Merli, M. and T. Roger, 2013. What drives the herding behavior of individual investors? *Finance*, 34(3): 67-104.
- Mouna, A. and J. Anis, 2015. A study on small investors' sentiment, financial literacy and stock returns: Evidence for emerging market. *International Journal of Accounting and Economics Studies*, 3(1): 10-19. Available at: <https://doi.org/10.14419/ijaes.v3i1.4098>.
- Müller, S. and M. Weber, 2010. Financial literacy and mutual fund investments: Who buys actively managed funds? *Schmalenbach Business Review*, 62(2): 126-153. Available at: <https://doi.org/10.1007/bf03396802>.
- Ngoc, L.T.B., 2014. Behavior pattern of individual investors in stock market. *International Journal of Business and Management*, 9(1): 1. Available at: <https://doi.org/10.5539/ijbm.v9n1p1>.
- Nofsinger, J.R., 2005. Social mood and financial economics. *The Journal of Behavioral Finance*, 6(3): 144-160. Available at: https://doi.org/10.1207/s15427579jpfm0603_4.
- Nofsinger, J.R., 2011. *The psychology of investing*. New York: Routledge.
- Nofsinger, J.R. and R.W. Sias, 1999. Herding and feedback trading by institutional and individual investors. *The Journal of Finance*, 54(6): 2263-2295. Available at: <https://doi.org/10.1111/0022-1082.00188>.
- Pompian, M.M., 2006. Behavioral finance and wealth management. How to build optimal portfolios for private clients. *Financial Markets and Portfolio Management*, 21(4): 491-492.
- Prosad, J.M., S. Kapoor and J. Sengupta, 2015. Behavioral biases of Indian investors: A survey of Delhi-NCR region. *Qualitative Research in Financial Markets*, 7(3): 230-263. Available at: <https://doi.org/10.1108/qrfm-04-2014-0012>.
- Soto-Acosta, P., S. Popa and D. Palacios-Marqués, 2016. E-business, organizational innovation and firm performance in manufacturing SMEs: An empirical study in Spain. *Technological and Economic Development of Economy*, 22(6): 885-904. Available at: <https://doi.org/10.3846/20294913.2015.1074126>.
- Spyrou, S., 2013. Herding in financial markets: A review of the literature. *Review of Behavioral Finance*, 5(2): 175-194. Available at: <https://doi.org/10.1108/rbf-02-2013-0009>.
- Suryanto, T., M. Haseeb and N.H. Hartani, 2018. The correlates of developing green supply chain management practices: Firms level analysis in Malaysia. *International Journal of Supply Chain Management*, 7(5): 316-327.
- Tan, W.-K., C.-H. Tan and H.-H. Teo, 2012. Consumer-based decision aid that explains which to buy: Decision confirmation or overconfidence bias? *Decision Support Systems*, 53(1): 127-141. Available at: <https://doi.org/10.1016/j.dss.2011.12.010>.
- Thaler, R.H., 2010. The end of behavioral finance. *Financial Analysts Journal*, 55(6): 12-17.
- Voorhees, C.M., M.K. Brady, R. Calantone and E. Ramirez, 2016. Discriminant validity testing in marketing: An analysis, causes for concern, and proposed remedies. *Journal of the Academy of Marketing Science*, 44(1): 119-134.
- Zaidi, F.B. and M.Z. Tauni, 2012. Influence of investor's personality traits and demographics on overconfidence bias. *Institute of Interdisciplinary Business Research*, 4(6): 730-746.

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