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# Evaluating stock trading behaviour: Information sources nexus through intrinsic and extrinsic motivation

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## Abstract

This study examines the effects of sources of information, including word-of-mouth (WOM) communication, and financial advice, on intrinsic and extrinsic motivations and stock trading behaviour in Pakistan. To test the model, we gathered 477 survey responses from individual stock investors. Our results exhibit that WOM communication and financial advice significantly influence stock trading behaviour. We also find that intrinsic motivations significantly mediate between financial advice and stock trading behaviour. Extrinsic motivations have significant mediation effects between sources of information and stock trading behaviour. Taken together, the results indicate that financial advice indirectly sparks stock trading through intrinsic and extrinsic motivations, whereas WOM communication performs the same function only through extrinsic motivations. The study results have several theoretical and practical implications for investors, stock brokerage firms, regulators, and governments.

## KEYWORDS

Financial advice, intrinsic and extrinsic motivations, Pakistan, stock trading, WOM communication

## 1 | INTRODUCTION

Why do stock traders trade so frequently in stock market securities? Traders face many challenges in stock markets, such as spending much time in getting information, researching their choices, analysing forecasts of securities, and trading of securities, stress and anxiety, physical and mental problems (S. U. Khan, Liu, Khan, Liu, & Hameed, 2018), agony about economic loss, and security

risk (Tai & Ku, 2013). Past literature answers that the investment by units and individuals is forced by the inherent motivations in investment, for example, increases in income, money, and wealth (Lewis, 2001). Moreover, the expectations of positive, large returns motivate investors to undertake more frequent trading in securities (Abreu & Mendes, 2012). Motivations in human psychology are described as multifunctional factors, that is, energy-propulsive factors, triggering and

encouraging factors, and being a facilitator and regulator of human endeavours (Corlaci, Hidi, Vasilescu, & Stoica, 2013). Self-determination theory (SDT) (Ryan & Deci, 2000a) argues that there are two types of psychological motivations: intrinsic motivation, where performing a task brings personal satisfaction or enjoyment, and extrinsic motivation, where performing a task brings a reward.

Psychological motivations can be defined as psychological forces that compel individuals to make investment decisions. Such motivations have been widely studied in different behavioural contexts and outlined as the encouraging factors of individual behaviour in the contexts of sports (Vallerand, 2007), workplace creativity and performance (Gerhart & Fang, 2015), online shopping (Shang, Chen, & Shen, 2005), e-learning (Yoo, Han, & Huang, 2012), and venture performance (Georgantzis & Zarifopoulou, 2017; S. Z. Khan, Yang, Khan, & Waheed, 2019). However, the previous literature shows that there is still very little research work aimed at understanding the role of psychological motivations in stock trading behaviour. As mentioned previously, stock investors face several problems in the stock market, and while coping with the problems, they do need psychological strength. It is, therefore, both logical and interesting to consider the importance of psychological motivations which have, so far, received little research attention in the context of investors' stock trading behaviour. Accordingly, the current paper evaluates how intrinsic and extrinsic motivation play roles in investor stock trading behaviour when the investors receive news by using the key sources of information.

Some studies have investigated the effects of sources of information, that is, financial advice and word-of-mouth (WOM) communication, on stock trading, and noted significant influence. Tauni, Rao, Fang, Mirza, et al. (2017) and Tauni, Rao, Fang, and Gao (2017), for example, reported the significant influence of sources on trading behaviour. However, little is known about how information sources influence stock trading through psychological motivations. Amabile (1993) demonstrated that an individual's behaviour can be intrinsically and extrinsically motivated by their social environment. The effects of an informed principal's advice on an individual's motivation and behaviour are also confirmed from the model of (Benabou & Tirole, 2003). Hence, this research investigates the direct and indirect effects of sources of information on stock trading behaviour through both intrinsic and extrinsic motivation.

Standard finance theory is heavily based on the suppositions of rationality and market efficiency. Traditional finance depicts investors as rational beings who always struggle to gain maximum utility. An efficient market is one in which a large number of rational investors compete with each other to forecast the future value of the market's securities, assuming that all fundamental

information is easily and freely available for everyone (Fama, 1965). In contrast, the proponents of behavioural finance challenge these suppositions and advocate that, along with rational factors, numerous irrational foundations push investors' behaviour. Based on different psychological characteristics borrowed from different disciplines of psychology, empirical research has proved the tangibility of investors' irrational behaviour. Such mental shortcuts are generally known as behavioural biases or heuristics; among them are overconfidence, availability bias, anchoring, mental accounting, over/under reactions, underreactions, and adjustment. Thaler (2005) clarified that such biases are deviations from standard financial practices. Tauni, Fang, and Iqbal (2017) investigated investor trading activities using the perspective of personality dimensions and noted varied effects of different dimensions on investor trading performance. Another key behavioural characteristic, "overconfidence," is mostly highlighted in many studies that overconfident investors do more trading in the market (Abreu & Mendes, 2012; Durand, Newby, Tant, & Trepongkaruna, 2013). Pitters and Oberlechner (2014) argued that investors sometimes use heuristics, such as rules of thumb, that enable individuals to make decisions quickly and decrease complications in a given condition.

In this study, by considering insights from another discipline of psychology called "human psychology," we propose a model to test variations in the trading behaviour of investors when they get information from different sources of information. More specifically, this study checks the direct and indirect impact of two sources of information (WOM communications and financial advice) through intrinsic and extrinsic motivation on investors' trading behaviour in the emerging economy of Pakistan. Adding to the literature of behavioural finance, we investigate how psychological motivations such as intrinsic and extrinsic motivation mediate the relationship of sources of information and the investors' trading behaviour. The mediation effects of psychological motivations give uniqueness to the model that will further broaden the theoretical base and improve practices in the area of behavioural finance.

## 2 | LITERATURE REVIEW

### 2.1 | Information sources and trading behaviour

#### 2.1.1 | Word-of-mouth (WOM) communication

WOM communication with relatives, friends, or peers is delineated as a vital source relied upon by investors for

exchanging information about the stock markets (Tauni, Fang, et al., 2017). Lusardi and Mitchell (2011) argued that financially unsophisticated individuals making financial decisions mostly rely on non-specialized information sources. In their study, Ivković and Weisbenner (2007) found that stock market participation by neighbours significantly influences stock market entry by households, and that people lacking financial literacy usually rely on the words of other investors surrounding them when they make investment decisions. Madrian and Shea (2001) reported a significant influence of social interaction on employees' participation in retirement plans, as employees usually follow the words of their colleagues in savings methods. Similar results that individuals' savings plans are significantly influenced by their peers' savings plans are confirmed by Duflo and Saez (2002). The proposed model of Hong, Kubik, and Stein (2004) depicted WOM communication as an important way of spreading information about stocks and further determined the significant effects of peers' stock market activities over social investors' stock market entry. Pool, Stoffman, and Yonker (2015) pointed out similarities in holding and trading behaviour between US fund managers living in the same neighbourhood.

Brown, Ivković, Smith, and Weisbenner (2008) revealed a tendency towards the stock market participation of individuals who have relations with a social group whose members are active in stock market activities. This research postulates that WOM interaction between the group members influences an individual's investment decisions. Campbell, Tabner, and Changwony (2015) reported the same results, that the involvement of an active social group member in the stock market significantly affects the stock market entrance of new group members. Kaustia and Knüpfer (2012) noted that new investors tend to enter the stock market in a geographical area where one or more active investors have been receiving positive returns from stock market activities. Hvide and Östberg (2015) noted a reduction in employee stock market entrance when employee peers receive negative returns from stock market trading. Abreu and Mendes (2012) observed the influence of the level of colleagues' stock market activity on their peers' investment decisions. Li (2014) highlighted the role of discussion with family members about the stock market, noting that it increases stock market participation. Li postulated that if a family member has invested money in the stock market in the last 5 years, the probability of the household entry into the stock market in the next 5 years is greater.

### 2.1.2 | Financial advice

Financial professionals can increase or limit the excessive trading behaviour of their clients. Tauni, Fang, et al. (2017) argued that the financial specialists are not affected much by behavioural biases, which can be defined as judgments, beliefs, and preferences and are further categorized into cognitive biases and emotional biases. Both types of bias yield nonrational behaviour, and therefore, the professionals' information is helpful to reduce the impact of these biases (Pompian, 2012). On the other hand, to maximize their commission income, these specialists may drive investors towards frequent trading in securities (Haigh & List, 2005). Quality of information has been designated as one of the influential factors of trading behaviour, particularly professional news which helps investors in adjusting their portfolios (Epstein & Schneider, 2008). Fischer and Gerhardt (2007) justified the positive influence of professional news on trading behaviour as news from professionals helps investors use their own skill in a better way, which in turn leads to more rational behaviour. Shapira and Venezia (2001) suggested that financial advice led to an increase in securities diversification and more frequent trading, documenting a significant positive influence of professional advice on investor trading behaviour. Although some studies have found a negative relationship between professional advice and trading behaviour (Gerhardt & Hackethal, 2009; Karabulut, 2013). Kramer (2012) investigated Dutch investors and found that advised investors more frequently trade in securities than self-directed investors do. Similar evidence was confirmed by Hackethal, Haliassos, and Jappelli (2012) in Germany, who concluded that financial advice increased stock trading. These pieces of evidence show that to earn more from commissions, financial advisors can influence investors to execute more frequent trading. Mullainathan, Noeth, and Schoar (2012) and Zhang (2014) noted that financial advice leads to riskier investment such as equity investment. Abreu and Mendes (2012) also found frequent trading by individual investors who have received news from financial specialists.

### 2.2 | Psychological motivations and trading behaviour

In the field of behavioural finance, several studies have investigated investors' trading behaviour on the basis of various psychological foundations. Using their proposed models, Daniel, Hirshleifer, and Subrahmanyam (1998) and Tauni, Fang, et al. (2017) found that investors cannot assess their investment skills and capability accurately

because of their behavioural biases. These papers showed that over time, investors become overconfident in their investment ability, and therefore, they trade excessively. Abreu and Mendes (2012) also reported that overconfidence matters in trading behaviour and noted more trade execution by overconfident investors.

Tauni, Fang, et al. (2017) investigated the impact of “personality psychology,” a discipline from psychology, and found that different personality traits bring variances in investor stock trading behaviour. Durand et al. (2013) substantiated consistent findings that personality dimensions are significantly associated with investor trading activities. Similarly, other studies have documented further psychological foundations that result in variance in the trading performance of investors (Dhar, Goetzmann, & Zhu, 2003; Graham, Harvey, & Huang, 2009; Grinblatt & Keloharju, 2009; Rashes, 2001).

Human psychology, a sub-discipline of psychology, asserts that psychological motivations play vital roles in determining human behaviour. Lee, Cheung, and Chen (2005) and Vallerand, Fortier, and Guay (1997) posited that psychological motivations, which are classified as intrinsic and extrinsic motivation, bring huge variations in human behaviour. Extrinsic motivation is depicted by an individual's engagement in a specific endeavour because there is a potential to attain a reward. Abreu and Mendes (2012) mentioned that investors in stock markets compete with each other to forecast the future value of the market securities in order to earn rewards such as abnormal returns. Intrinsic motivation is depicted by an individual's engagement in a specific activity for their internal satisfaction. Because of internal self-attribution, which are reasons derived from within oneself, investors get personal satisfaction by thinking that they have good investment skills, and hence, they engage in securities trading. Ryan and Deci (2000b) acknowledged that people feel internally satisfied and competent when they are engaged in autonomous settings such as a stock trading platform. Investors feel satisfied and are willing to bet on their own decisions because they consider themselves knowledgeable and skilful (Graham et al., 2009). Lee et al. (2005) argued that an individual's behaviour in any activity is partly determined by both extrinsic and intrinsic motivation.

Psychological motivations have been widely investigated in different contexts of studies related to behaviour, and its role is always admitted to have a highly significant impact on individual behaviour, as mentioned previously. Tremblay et al. (2009) considered motivated people as a strategic asset and competitive advantage for any industry. The above-cited evidence reveals how intrinsic and extrinsic motivation play roles and result in variations in individual behaviour. However, little is known

about how psychological motivations play a role in investors' behaviour in the stock markets. Tauni, Fang, et al. (2017) emphasized using new approaches to explore the phenomenon of investors' behaviour in financial markets based on psychological characteristics.

### 2.3 | Information sources, psychological attributes, and trading

Several studies in the domain of investor trading behaviour have documented how information sources and psychological aspects are related to trading. For example, Tauni, Fang, et al. (2017) highlighted the trading activities of investors from the personality/psychological perspective and highlighted the significant varied effects of different personality dimensions on investors' trading activities when they get information. The study argued that investors with openness and neuroticism dimensions execute more securities trades when they receive professional information. Investors with extraversion and agreeableness dimensions execute little trade as a result of receiving professional news; however, these investors execute more trades when they get information from WOM communication. Yang, Hsu, and Tu (2012) studied trading behaviour in the future markets and described how professional advisors with different personality dimensions can affect the investors' trading activities and their confidence. They show that professional advisors with extraversion and conscientiousness traits can raise investors' confidence and trading. They explained the phenomenon by saying that high scorers on extraversion can get more accurate information from their social networks, and thus, by sharing the information with investors, they can increase their confidence and trading volume. They further argued that conscientious advisors respond to their clients by showing themselves committed and the trait (conscientiousness) helps them in conducting successful trades.

Tauni, Fang, Rao, and Yousaf (2015) explored the trading behaviour of Chinese investors in the futures market, finding how personality dimensions moderate the association between information acquisition and trading frequency. They found that information acquisition is directly proportional to the investors' trading volume, and that the extraversion, conscientiousness, and openness significantly moderate that relationship. Abreu and Mendes (2012) investigated the effects of sources of information on the trading performance of overconfident and underconfident investors, finding that overconfident investors do not trade more when they receive information from WOM communication, while normal investors trade excessively when they receive news from

professionals. Karabulut (2013) observed a lower demand for professional advice in behaviourally-biased investors. He demonstrated that overconfident investors perform fewer trades in securities when they get professional advice. Graham et al. (2009) worked on competence effects on trading activities among male and female investors and determined that wealthy and knowledgeable male investors usually perform trades based on their own judgment. Barber and Odean (2001) gave the same result, arguing that overconfident investors mostly rely on their own skills instead of professional news.

The evidence cited above indicates how information sources and psychological attributes of investors interact with each other, and in turn, influence their trading activities. To further explore other psychological attributes that might influence investor trading activities, the current study considers psychological motivations, in particular, intrinsic and extrinsic motivation. The current study is helpful in answering questions like why incentives do not work well in all contexts. Why do investors give wrong advice and thus undermine the confidence of potential investors? Does taking support from others enhance or harm the self-esteem of investors? Benabou and Tirole (2003) emphasized the interplay between an individual's social environment and their personal motivations. Individuals can be intrinsically or extrinsically motivated by their affection for their social environment (Amabile, 1993). Therefore, the current study posits that psychological motivations play a positive role in the association between information sources and trading performance. The authors found no research study of the Pakistani stock market revealing that psychological motivations contribute to the investors' trading performance by influencing the positive association of information sources and trading frequency.

### 3 | METHODOLOGY

#### 3.1 | Sample and procedure

This research focuses on individual investors' trading behaviour in Pakistan. Using a convenient sampling technique and following S. U. Khan, Liu, Liu, Khan, and Hameed (2020), an online method was used for collecting data. An electronic version of a structured questionnaire was sent to the investors. We approached the investors from different groups on social media which are specifically created by brokerage firms for guiding and sharing important information about stock markets with traders. In addition, we also shared the questionnaire with teachers and students of business schools in five universities in Islamabad. The respondents were assured that

their responses would be used only for research purposes. The online sampling technique is considered the most appropriate in such a context, as it is less costly than offline methods, has a wider reach in a diversified population, and the data collection can be completed in a short time period (I. U. Khan, Hameed, & Khan, 2017). The electronic questionnaire was shared with 1,345 investors, out of which 477 valid responses were received and used in the final analysis, representing a response rate of 35%. Table 1 indicates the demographics of the respondents.

**TABLE 1** Investors demographic information

	Frequency	%
<b>Gender</b>		
Male	381	79.9%
Female	96	20.1%
<b>Age</b>		
>30	70	14.7%
30–45	225	47.2%
45–60	106	22.2%
<60	76	15.9%
<b>Education</b>		
Below bachelor	45	9.4%
Bachelors	101	21.2%
Masters	213	44.7%
Above masters	118	24.7%
<b>Income</b>		
>50,000	187	39.2%
50,000–100,000	222	46.5%
100,000–200,000	33	6.9%
<200,000	35	7.3%
<b>Occupation</b>		
Employee	279	58.5%
Self-business	97	20.3%
Professional	59	12.4%
Other	42	8.8%
<b>Experience</b>		
Less than 2 years	94	19.7%
2–5	175	36.7%
5–10	112	23.5%
Above 10	96	20.1%
<b>Total investment</b>		
Less than 2 lakh	137	28.7%
2–6	236	49.5%
6–10	55	11.5%
Above 10	49	10.3%

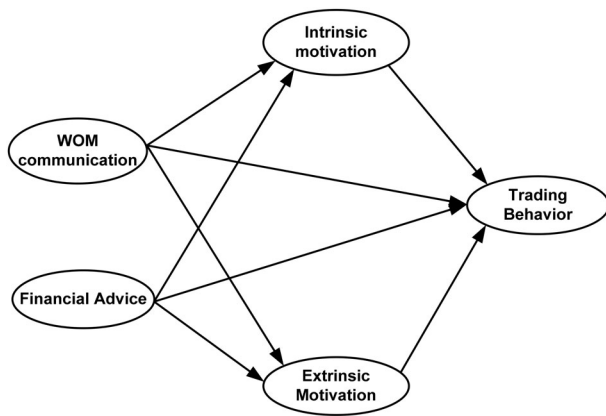


FIGURE 1 Proposed model

### 3.2 | Measures

The study uses two independent variables (WOM communication, financial advice), two mediators (intrinsic motivation, extrinsic motivation), and one dependent variable (trading frequency), as shown in Figure 1. We use the measures defined by Abreu and Mendes (2012) and Durand, Newby, and Sanghani (2008) for assessing WOM communication and financial advice. WOM communication represents the acquisition of information from family members, friends, and colleagues regarding stock markets. Financial advice refers to news from stock-brokers, bank managers, and other financial professionals. The measuring items of extrinsic and intrinsic motivation were borrowed from (Tremblay et al., 2009). A 5-point Likert scale ranging from 'strongly disagree to strongly agree' was used for measuring extrinsic and intrinsic motivation. The measuring item for the dependent variable was taken from (Abreu & Mendes, 2012; Graham et al., 2009).

## 4 | DATA ANALYSIS AND RESULTS

The reliability and validity of the constructs and the structural relationship of the proposed research model were tested through the partial least squares (PLS) approach and the Statistical Package for Social Sciences (SPSS). PLS is an extensively used approach for executing various complicated statistical analyses (Hair, Sarstedt, Ringle, & Gudergan, 2017) while, according to Ong and Puteh (2017), SPSS is the most widely used software among researchers, as it provides a friendly environment in which to conduct a variety of statistical tests.

### 4.1 | Common method bias (CMB)

If data are collected through a questionnaire from the same respondents and at the same point in time, then there is a chance of CMB (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). To check whether our data suffers from CMB, we used Harmon's one-factor test through SPSS. We observed that the first factor explained only 42.91% of the variance, which suggests no serious issue of CMB in this research.

### 4.2 | Confirmatory factor analysis (CFA)

First, the normality of the data was assessed by calculating the values of skewness and kurtosis. As shown in Table 2, we obtained satisfactory values within the range  $\pm 2$  for all constructs (George & Mallery, 2010). CFA was conducted to evaluate our model fitness (Hair, Anderson, Tatham, & Black, 1998). The results of CFA indicate acceptable loadings of intrinsic and extrinsic motivation. Moreover, Cronbach's alpha, composite reliability, and average variance extracted (AVE) (Heavey and Simsek) values were also obtained, all of which were within the threshold levels, as indicated in Table 2. The results confirm good convergent validity (Fornell & Larcker, 1981; Hair et al., 1998).

Discriminant validity was assessed using two approaches: the Fornell and Larcker (1981) suggestions and the HTMT approach. As Table 3 depicts, the square root of AVE is higher than the correlations among the variables, thus showing acceptable discriminant validity (Boateng, Adam, Okoe, & Anning-Dorson, 2016). The values of the correlations, which are all below 0.70, also highlight that there is no issue of multicollinearity. Table 4 displays the results of the HTMT approach, showing that all values are less than .85, which suggests acceptable discriminant validity (Henseler, Ringle, & Sarstedt, 2015).

To test for multicollinearity, we calculated the tolerance value, which was higher than 0.1, and variance inflation factors (VIFs) values, which were below 10, suggesting the absence of any multicollinearity issues (Mason & Perreault Jr, 1991). We found that all the VIF values were between 1 and 1.593, indicating the absence of multicollinearity in this study.

### 4.3 | Results and discussion

We calculated our results following Baron and Kenny's (1986) approach, which showed the significant influence of each independent variable (IV) on both the

**TABLE 2** Factor loadings

	Estimate	CA	CR	AVE	Skewness	Kurtosis
Intrinsic motivation		0.634	0.794	0.565	−.966	.973
IM1	0.652					
IM2	0.763					
IM3	0.829					
Extrinsic motivation		0.764	0.862	0.675	−.550	.113
EM1	0.835					
EM2	0.784					
EM3	0.846					
WOM communication					−.697	−.064
Financial advice					−.506	−.350
TB					−.760	0.070

**TABLE 3** Correlation and discriminant validity

	1	2	3	4	5
1. Extrinsic motivation	<b>0.752</b>				
2. Financial advice	0.330	<b>1</b>			
3. Intrinsic motivation	0.069	0.142	<b>0.822</b>		
4. TB	0.403	0.376	0.179	<b>1</b>	
5. WOM communication	0.280	0.455	0.044	0.404	<b>1</b>

Note: Diagonal elements are the square root of the average variance extracted (AVE) of each construct; Pearson correlations are shown below the diagonal.

**TABLE 4** HTMT results

	1	2	3	4	5
1. Extrinsic motivation					
2. Financial advice	0.405				
3. Intrinsic motivation	0.095	0.157			
4. TB	0.459	0.376	0.2		
5. WOM communication	0.347	0.455	0.047	0.404	

mediators and dependent variable (DV), and the significant influence of both mediators on the DV. However, Hayes (2009) challenged this approach, saying that the significant relationships mentioned above are not necessary for mediation. The results, depicted in Table 5, show that the independent variables WOM communication ( $\beta = 0.293$ ,  $p < .001$ ) and financial advice ( $\beta = 0.242$ ,  $p < .001$ ) significantly and positively influence the dependent variable, that is, the trading behaviour of investors. The effect of WOM communication on extrinsic motivation ( $\beta = 0.16$ ,  $p < .001$ ) is also significant. However, WOM communication ( $\beta = -.027$ ,  $p = .603$ ) has an insignificant effect on intrinsic motivation. Financial advice significant impacts both intrinsic motivation ( $\beta = 0.15$ ,

**TABLE 5** Regression results

	Estimate	p
<b>Structural model 1</b>		
TB ← WOM communication	0.293	***
TB ← financial advice	0.242	***
<b>Structural model 2</b>		
Intrinsic motivation ← WOM communication	−0.027	.603
Intrinsic motivation ← financial advice	0.15	**
Extrinsic motivation ← WOM communication	0.16	***
Extrinsic motivation ← financial advice	0.25	***
<b>Structural model 3</b>		
TB ← intrinsic motivation	0.154	***
TB ← extrinsic motivation	0.359	***

Note: \*\*\* $p < .001$ , \*\* $p < .05$ , \* $p < .10$ .

$p < .05$ ) and extrinsic motivation ( $\beta = 0.16$ ,  $p < .001$ ). Our findings also reveal significant positive effects of both two mediators, intrinsic motivation ( $\beta = 0.154$ ,  $p < .001$ ) and extrinsic motivation ( $\beta = 0.359$ ,  $p < .001$ ), on the trading behaviour. The R square in our results shows that WOM communication and financial advice bring variances of 14 and 20% in the motivation and trading behaviour, respectively.

As shown in Figure 1, intrinsic and extrinsic motivations mediate the influence of WOM communication and financial advice on trading behaviour. Using the bootstrapping approach of Preacher and Hayes (2008), we tested the mediation effects with a 95% bootstrap confidence interval. As indicated in Table 6, we found significant indirect effects of WOM communication, excluding zero (CI.95 = 0.0396, 0.1219) on the trading behaviour through extrinsic motivation. However, we found an

TABLE 6 Mediation results

	Effect	SE	CI <sub>s</sub>
95% Bootstrap confidence intervals for indirect effect			
Intrinsic motivation			
WOM communication	0.006	0.0076	(-.0063, 0.0239)
Financial advice	0.0182	0.0092	(0.0036, 0.0399)
Extrinsic motivation			
WOM communication	0.0762	0.0221	(0.0396, 0.1219)
Financial advice	0.0935	0.0234	(0.0523, 0.1432)

insignificant indirect effect of WOM communication (CI.95 = -0.0063, 0.0239) on trading behaviour through intrinsic motivation. Further, the results clarify the indirect effect of financial advice on trading behaviour through intrinsic (CI.95 = 0.0036, 0.0399) and extrinsic (CI.95 = 0.0523, 0.1432) motivation, that is, both significantly impact trading behaviour.

The overall findings of the study reveal the vital role of sources of information in influencing psychological motivations and investor trading behaviour in Pakistan. In particular, our findings show the significant impacts of WOM communication and financial advice on intrinsic motivation, extrinsic motivation, and the trading behaviour of investors. These findings complement the results of prior studies, such as Tauni, Fang, et al. (2017), Tauni et al. (2015), and Abreu and Mendes (2012), which explored the relationship of sources of information with different psychological factors (e.g., personality, overconfidence) and investor trading behaviour. Those studies and ours determined that sources of information are crucial factors affecting investors' psychological attributes and their trading behaviour in the stock market. Perry and Porter (1982) considered the relationship of external environmental factors with individuals' motivation and behaviour. They hypothesized that external environmental factors which can be categorized greatly influence individuals' motivations, which in turn, influence their behaviour. The literature argues that in economic settings or social settings, WOM communication can motivate individuals and their influence their behaviour (Banerjee, 1992; Bikhchandani, Hirshleifer, & Welch, 1992; Mahadin & Akroush, 2019). Amabile (1993) documented that social environments indirectly affect the behaviour of individuals through intrinsic and extrinsic motivation.

The insignificant indirect effect of WOM communication on trading behaviour indicates that investors are not intrinsically motivated to do frequent stock trading in the market when they receive news through WOM communication. This confirms Fischer and Gerhardt's (2007) argument that when investors receive news through

unreliable sources such as WOM communication, they rarely evaluate their own skills and knowledge in a better way. Our results are in line with the findings of Epstein and Schneider (2008), who argued that the quality of information matters in the trading behaviour of investors, as unreliable sources lead to little trading behaviour. These results are also aligned with the view of Tauni, Fang, et al. (2017), who argued that compared to professional news, news from unreliable sources such as WOM communication affect investors' trading behaviour less because of the weaker analysis of the market.

The results of this study indicate that sources of information play a vital role in investors' stock trading behaviour. In a collectivist culture, WOM communication plays a major role in predicting individual behaviour. According to I. U. Khan et al. (2017), Pakistan has a collectivist culture; hence, the significant effects of WOM communication on Pakistani investor trading behaviour is evident and reasonable. Argan, Sevil, and Yalama (2014) assert that market participants get pleasure from discussion with fellow participants about the stock market movements. The financial specialists have vast knowledge and experience of investment, which means that they can precisely explain the positive and negative aspects of various investment options, which in turn affects investor behaviour in a positive way. Argan et al. (2014) aver that financial advisor communication is very effective in the holding or trading behaviour of investors and reported significant positive effects.

As shown in Figure 2, our results reveal that intrinsic and extrinsic motivations both have a positive impact on trading behaviour in our sample. The results of our study agree with the findings of previous multi-contextual studies that found a significant positive influence of intrinsic or extrinsic motivation on individual behaviour. This phenomenon has been confirmed, for example, in the case of employee engagement creativity and productivity performance (Mitchell, Schuster, & Jin, 2018), in online shopping (Shang et al., 2005), internet-based learning (Lee et al., 2005), and in sports performance (Corlaci et al., 2013).



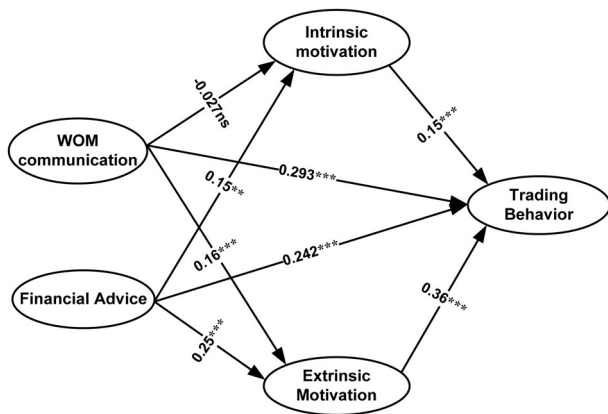


FIGURE 2 Model with results

## 5 | CONCLUSION AND IMPLICATIONS

This paper examined the direct and indirect effects of sources of information (WOM communication, financial advice) on investors' stock trading behaviour in Pakistan through psychological motivations (intrinsic and extrinsic motivation). To the best of the authors' knowledge, no research has been done revealing that psychological motivations contribute to investor trading performance in Pakistani stock markets by influencing the association of information sources and trading frequency. Following Baron and Kenny (1986), we first investigated the impact of sources of information on intrinsic and extrinsic motivations. Second, we tested the effects of intrinsic and extrinsic motivations on trading behaviour. In the third and fourth steps, we checked the direct impact of sources of information on trading behaviour and then the indirect effects through intrinsic and extrinsic motivation. Besides this, in an alternate model, we also tested the interaction effects of intrinsic and extrinsic motivations in the association between sources of information and stock trading behaviour. A total of 1,345 experienced stock investors were electronically contacted by sending them the electronic version of our survey questionnaire. We received 477 effective responses from the investors, which were then used in the final analysis.

The findings of this study demonstrate a significant positive effect of financial advice on intrinsic and extrinsic motivation, while WOM communication significantly influences only extrinsic motivation. Intrinsic and extrinsic psychological motivations are also revealed to have a significant positive impact on trading behaviour. Similarly, we found significant positive impacts of sources of information on trading behaviour in Pakistan. Furthermore, the indirect impact of financial advice on trading behaviour through intrinsic and extrinsic motivation is

significant. WOM communication significantly impacts trading behaviour through extrinsic motivation. The R square values explain the 14% variance in intrinsic motivation and trading behaviour and 20% variance in extrinsic motivation and trading behaviour. In our alternate moderation model, extrinsic motivation moderates the association between financial advice and trading behaviour. The interaction effects of extrinsic motivation between WOM communication and trading behaviour, intrinsic and extrinsic motivation between sources of information and trading behaviour are insignificant in our sample. The alternate model explains (R square) the 31% variance in the trading behaviour.

Theoretically, this study makes several contributions. First, it extends the current literature of stock trading behaviour by assessing a model incorporating types of psychological motivation. The results indicate that intrinsic and extrinsic motivation have significant positive impacts on trading behaviour. Moreover, these motivations also have significant mediating effects on the association of sources of information and trading behaviour. Thus, this study enhances the literature by introducing and testing psychological motivations in the context of trading behaviour. Second, the study enhances the scholarly understanding of sources of information by identifying the indirect effects of WOM communication and financial advice on trading behaviour through intrinsic and extrinsic motivation. A few studies (e.g., Abreu & Mendes, 2012; Tauni, Fang, et al., 2017) have reported that sources of information directly influence trading behaviour, but our study is the only one that identifies that the sources also enhance intrinsic and extrinsic motivations. Third, this paper enriches the understanding that intrinsic and extrinsic motivations are important in trading behaviour. Prior research highlighted the vital role of intrinsic and extrinsic motivations in various behavioural contexts (Corlaci et al., 2013; Lee et al., 2005; Mitchell et al., 2018) but not in stock trading. The results of the study extend the findings of prior studies by determining that intrinsic and extrinsic motivations influence investor stock trading behaviour in a developing country.

Simultaneously, this research contributes to knowledge about the triggers of investor trading activities. For instance, the study determined that sources of information enhance psychological motivations and trading behaviour. Stock brokerage firms and companies might be interested in capitalizing on these factors in order to boost stock trading. Stockbrokers should facilitate maximum activity by investors by providing as much professional advice as possible. This will motivate investors intrinsically and extrinsically to make more trades in stocks. Moreover, firms should consider the importance of WOM communication in sparking trading activities.

The firms should encourage and offer incentives to their clients to advertise and discuss the trading activities frequently in their social circles. This will facilitate the entry of new investors and will increase stock trading. Also, public limited companies with shares sold in the market should provide accurate and clear information so that the investors can evaluate which portfolio is best, which in turn, will influence the motivation and behaviour of others in their social circle. Kaustia and Knüpfner (2012) demonstrated that positive returns motivate and facilitate new neighbourhood entry in stock markets, while negative returns discourage neighbourhood entry. Considering the study results, governments can emphasize that companies must provide accurate information to enable investors to trade wisely and motivate potential investors; Epstein and Schneider (2008) also argued that clear and reliable information enhances trading.

## 6 | LIMITATIONS AND FUTURE RESEARCH DIRECTION

The study acknowledges some limitations. First, being cross-sectional in nature, the study is unable to explain the investors' behaviour over time. Therefore, future studies should conduct a longitudinal analysis to explain how temporal changes impact individual investor trading behaviour. Second, the several insignificant results we found might be due to cultural effects. Pakistan is an Islamic country, where some people doubt the religious legitimacy of stock trading and investing (Ali, Shafeeq, & Ali, 2012; S. U. Khan et al., 2018). That implies that the findings of the study may not be generalizable to other countries. Future studies should test the model in other nations and cultures to prove its applicability. Third, the study did not take into account the behaviour of different classes of investors, categorized by their investment size as well as education, age, and other demographic characteristics. Prior studies have seen variation in the behaviour of investors differentiated by wealth (Peress, 2004) and age (DaSilva & Giannikos, 2006). Thus, future studies could test the model for different classes of investors.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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