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ENTREPRENEURSHIP PSYCHOLOGY, CSR, AND SUSTAINABILITY

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Investor Psychology, Mood Variations, and Sustainable Cross-Sectional Returns: A Chinese Case Study on Investing in Illiquid Stocks on a Specific Day of the Week

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This paper uncovers a new finding of sustainable cross-sectional variations in stock returns explained by mood fluctuations across the days of the week. Long/short leg of illiquid anomaly returns are extensively related to the days of the week, and the magnitude of excess returns is also striking [Long leg refers to portfolio deciles that earn higher excess returns. Historical evidence suggests that more illiquid stock earn higher excess returns (Amihud, 2002; Corwin and Schultz, 2012)]. The speculative leg of illiquid anomalies is the long leg (Birru, 2018) [The speculative leg falls into the long leg of anomaly because more illiquid stocks are sensitive to investor sentiment (Birru, 2018)]. Therefore, the long (speculative) leg experiences more sustainable high returns on Friday than the short (non-speculative) leg. At the same time, relatively higher long (speculative) leg returns were witnessed on Friday than Monday with a greater magnitude difference. These cross-sectional variations in illiquid stocks on specific days are consistent with the explanation of the limit to arbitrage. The observed variations in cross-sectional returns are sustained and consistent with plenty of evidence from psychology research regarding the low mood on Monday and high mood on Friday.

Keywords: speculative stocks, mood variations, day of the week, sustainable cross-sectional returns, anomalies

INTRODUCTION

Behavioral finance researchers critique traditional finance theories by arguing in the favor of the psychology aspect of investors as a core determinant of asset-pricing research. Therefore, it has been a long-standing area of interest for economists to explore whether investor sentiment affects stock prices or not. There is no role of investor sentiment in the presence of classical finance theory. Instead, classical finance theory argues that the competition amongst rational investors – who make portfolios to diversify the statistical properties – will lead to an equilibrium in which prices are equal

to realistically discounted values of expected future cash flows. Here, the cross-sectional expected returns depend solely on the cross-sectional systematic risks (Rasheed et al., 2016; Yang et al., 2019). According to classical finance theory, even if there are some irrational investors, the demands of these investors are compensated by arbitrageurs and therefore have no considerable impact on prices (Ying et al., 2019).

A sentimental hypothesis represents a clear prediction that anomalies reveal variation in returns across days of the week, and earlier studies (Baker and Wurgler, 2006, 2007, 2012) have focused on the anomalies that theorizes that prediction is related to sentiment. Particularly, this research has focused on anomalies related to illiquidity and a theory that predicts that one leg should be clearly speculative and one clearly non-speculative. Importantly, individual action and behavior is determined by mood, and it is one of the powerful determinants. Variations in mood have been found to persuade less than fully rational behavior of financial markets, not only from individual investors but from institutional investors as well (Goetzmann et al., 2015).

The weekend effect has not existed since 1975 (Robins and Smith, 2016). The presence of a strong cross-sectional effect is still not surprising since mood variations provide clear predictions, but these patterns do not lead to comprehensive predictions. As Baker and Wurgler (2007) argue in relation to sentiment, theory does not provide obvious comprehensive predictions. For example, speculative stocks are more sensitive to sentiment, and, with the decrease in sentiment, the price of the stocks will also decline. This scenario can lead to fluctuations in quality, which will cause an increase in prices of non-speculative or safe stocks (Kong et al., 2019). Therefore, sentiment provides obvious cross-sectional prediction as has previously been argued. This study will focus on specific types of cross-sectional investment strategies, which will clearly show day-of-the-week return by considering the sentimental hypothesis.

In earlier studies, many researchers documented that stock markets perform low on Mondays [early studies include (Cross, 1973; French, 1980; Gibbons and Hess, 1981)]. Though many studies explored the weekend effect, none of them have produced satisfactory results. Investor sentiment diverges across the days of the week since mood is a deviating factor that affects sentiment (Ma and Tanizaki, 2019). In capital markets, the existence of pessimism and optimism (which is not related to the fundamentals) – generally called sentiment – provides clear predictions of cross-sectional return. The variation in sentiment will have a contemporary effect on returns, and it will highly affect the prices of stocks that are not easy to value, that are very subjective to value, or that are difficult to arbitrage (Baker and Wurgler, 2006). Therefore, the hypothesis predicts that, in comparison to non-speculative stocks, speculative stocks will earn high returns on Friday and low returns on Monday (Birru, 2018).

The analysis of the variation in mood across the days of the week has remained a vigorous research dimension in the field of psychology ever since the first extensive study was conducted by Rossi and Rossi (1977). Though the exact flow of the variations in mood over the course of the week has long been debated, one comparatively unquestionable finding has been discovered in the literature: there exists a higher mood on the weekend and Friday than from Monday to Thursday. Generally, the mood increases from Thursday to Friday and decreases on Monday. Mixed results exist in literature regarding the mood variation from Monday to Thursday (Shah et al., 2019). Some recent studies have used a large heterogeneous sample of the individuals and expanded our understandings. For example, Stone et al. (2012) and Helliwell and Wang (2014) used the sample data from the Gallup organization of the United States that was gathered through telephonic questionnaires, and this study consisted of more than 340,000 individuals above the age of 18. Their findings are also consistent with the theory that mood is higher on Friday than Monday to Thursday. As only Friday and Monday are the days of the week that provide the obvious psychological forecast, our analysis will focus only on these days. The strong psychological evidence that mood is higher on Friday and lower on Monday predicts higher returns for speculative stocks on Friday than non-speculative characteristics of stocks, and an inverse pattern exists on Monday. Our study contributes to the literature: it presents a specific explanation of stocks as being sensitive to sentiment, and it provides evidence of cross-sectional variations of returns on particular days by linking a speculative leg of illiquid stocks with mood theory from psychology literature. This study also provides different investment strategies to earn excess returns across the days of the week by investing in illiquid stocks.

Numerous hypotheses motivate the analysis in this study. One of the possible theories is that the trading behavior of institutions changes with the days of the week, and this, in turn, causes the predictable variation of cross-sectional returns across the days of the week. Other reasons are related to the content and timing of the news release. Cross-sectional variation may be found in the contents and timings of the announcement of good or bad news. Another possible explanation is related to the timing of macroeconomic news announcements; it is sometimes observed that good or bad macroeconomic news is systematically released on particular days of the week. These systematic patterns have cross-sectional return effects, and this study has incorporated these explanations in order to check and verify the true relationship.

On the basis of the published literature we test four hypotheses.

H1: The speculative leg of anomalies earns a higher return on Friday than Monday due to mood variations across the days of the week.

H2: The speculative leg of anomalies earns higher stock returns on Friday than the non-speculative leg.

H3: The speculative leg of anomalies earns higher long minus short strategy returns on Friday than Monday.

H4: The observed cross-sectional variation in the stock return is inconsistent with the impact of Firm-specific news and Macroeconomic news.

MATERIALS AND METHODS

In this section, our analysis has focused on the characteristics of illiquid stocks that theory predicts are affected by the sentiment. According to Baker and Wurgler (2006, 2007), stocks that are most affected by the sentiment are difficult to value or are subjective and hard to arbitrage. Practically, stocks that have either subjective characteristics in terms of valuation or that are hard to arbitrage are likely to be the same (Birru, 2018).

Literature from Psychology hypothesizes that mood affects decisions when situations are not clear or adequate information is not available (Clore et al., 1994; Forgas, 1995; Hegtvedt and Parris, 2014; Sarfraz et al., 2019). Conversely, stocks that do not have a precise valuation will give experienced investors a misrepresentation of the valuation of the stocks, and this varies with the existing state of sentiment. Baker and Wurgler (2006) have assessed the related dimensions to differentiate the speculative intensity of stocks, and they found that stocks are the paying status of dividend, intense growth, size, level of distress, profitability, and age. More precisely, Birru (2018) mentioned that illiquid stocks face greater impediments to arbitrage. Therefore, our analysis will focus on illiquid stocks because these stocks are sensitive to sentiment, and they should have higher speculative returns on Friday than Monday. For this purpose, we have taken two measures for illiquid stocks: Amihud's illiquidity measure (Amihud, 2002) and the Bid-Ask spread (Corwin and Schultz, 2012)[1]. Portfolio performance is measured through the value of the Jensen Alpha, and it is a risk-adjusted measure of performance that represents the average return of the portfolio investment, below or above the different asset pricing models, given investment's beta or market average return.

Portfolio Construction

Illiquidity is measured following the methodology of Amihud (2002) and Corwin and Schultz (2012). Portfolios are then generated by making 10 deciles based on calculated values for each stock following the methodology of Amihud (2002) and Corwin and Schultz (2012). We took, however, only decile one and 10 of both measures for the portfolio construction, as our analysis was based on speculative and non-speculative characteristics of each portfolio and fell only in extreme deciles. Portfolios constructed for both anomalies are rebalanced every month. A penalized expected risk criterion is one of the widely used portfolio construction approach (Luo et al., 2019). Birru (2018) mentioned that illiquid stocks are sensitive to sentiment, and stocks that are more illiquid face higher impediments to arbitrage. Therefore, the highest decile of illiquid stocks will earn higher returns on Friday than Monday and higher long minus short returns on Friday than Monday. **Supplementary Table S1** provides more insights regarding the possible returns on particular days and the details of both anomalies.

Supplementary Table S1 describes the division of the sample for anomalies and speculative strategies. It indicates the division of anomalies into Long leg and Short leg, and it also indicates the expected speculative leg for each anomaly and the brief explanation for speculative reason. The table also reports the expected returns for a speculative leg on particular days.

Data

The data set that we use for our analysis was taken from Wind Information Incorporation[2]. The analysis period for our study was from January 1996 to December 2018 for Amihud's illiquidity measure and from 2005 for the Bid-Ask spread measure and the target of our analysis is Chinese A-shares market for both the Shanghai and Shenzen stock exchanges. The Chinese A-shares market started domestic trading in 1990 with the establishment of both stock exchanges.

Our focus was based on post-1996 data for two reasons. The first reason was to ensure uniformity in the data. Though principles of fair trade and reporting were introduced in 1993, companies do not have much guidance on how to do this practically. The implementations of rules and regulations take time and yet produced a lot of discrepancies in the early years. Most of the firms take the liberty to make their standards of implementation for financial reporting, and this thus creates comparability issues (Ghulam et al., 2019). The second reason belongs to the minimum required numbers in the creation of portfolios. To attain reasonable power and precision, the portfolio construct should be based on 10 equal deciles, and each decile should have a minimum of 50 values after using all filters.

RESULTS AND DISCUSSION

Results

Illiquidity: Friday Long Minus Short

Focusing on the long minus short returns on Friday for Amihud's illiquidity measure, panel A of **Table 1** shows that Friday accounts for more than 113 basis points per month excess returns according to CAPM, while the Fama and French three-factor alpha, Carhart four-factor alpha, and Fama and French five-factor alpha account for 95, 79, and 75 basis points of excess returns, respectively, for each month. Panel B of **Table 1**, however, examines long minus short returns for portfolio constructs through Amihud's illiquid measure on Monday. According to the results of **Table 2**, Monday accounts for negative alpha values for all measurement models, and these results are consistent with the mood theory that Friday accounts for higher long minus short strategy returns due to a higher mood than the lower mood on Monday.

Panel A of **Table 2** focuses on the long minus short strategy returns of Bid-Ask spread anomaly on Friday and presents the same predication that Friday alone provides 46, 49, 48, and 44 basis points monthly in excess returns against CAPM, the Fama and French three-factor model, the Carhart four-factor model, and the Fama and French five-factor alpha,

[1]The estimation method of anomalies and their definitions are provided in the **Supplementary Material**.

[2]The wind is the most extensive and most reliable data provider database of China. The wind database serves more than 70% of QFII (Qualified Foreign Institutional Investors) and 90% of Chinese financial institutes.

TABLE 1 | Panels **A** and **B**: long minus short strategy returns (Amihud's illiquidity measure).

Panel A (Friday long minus short strategy returns)						
	Friday long	***T*-statistics**	**Friday short**	***T*-statistics**	**Friday long–short**	***T*-statistics**
CAPM	0.0113672	(2.91)	−0.0000811	(−2.16)	0.0113662	(3.15)
FF3	0.0094585	(2.40)	−0.000114	(−2.62)	0.0095726	(2.45)
Carhart4	0.0077422	(2.49)	−0.0000739	(−2.14)	0.0079358	(2.92)
FF5	0.0132384	(2.69)	−0.0000167	(−2.03)	0.0074951	(2.87)
Panel B (Monday Long minus short strategy returns)						
	Monday long	***T*-statistics**	**Monday short**	***T*-statistics**	**Monday long–short**	***T*-statistics**
CAPM	−0.0004678	(−3.35)	0.0012095	(3.05)	−0.0016774	(−2.29)
FF3	−0.0011018	(−2.81)	0.0010962	(2.84)	−0.002198	(−2.69)
Carhart4	−0.0013681	(−2.00)	0.0009015	(2.50)	−0.0022696	(−2.71)
FF5	−0.0018303	(−2.34)	0.0009323	(1.91)	−0.0027626	(−3.09)

This table examines long minus short monthly portfolio returns based on Amihud's illiquidity measure to invest in a particular day of the week. Panel A reports long minus short strategy returns on Friday, and panel B reports long minus short strategy returns on Monday. The panels indicate the values of Alpha for CAPM, the Fama and French three-factor model, the Carhart four-factor model, and the Fama and French five-factor model. Portfolios are equally weighted, and values of t-statistics are adjusted for autocorrelation and heteroscedasticity.

TABLE 2 | Panels **A** and **B**: long minus short strategy returns (Bid-Ask spread measure).

Panel A (Friday long minus short strategy returns)						
	Friday long	***T*-statistics**	**Friday short**	***T*-statistics**	**Friday long–short**	***T*-statistics**
CAPM	0.0024509	(3.01)	−0.0022354	(−5.30)	0.0046863	(6.34)
FF3	0.0023808	(2.88)	−0.0025514	(−5.99)	0.0049322	(6.60)
Carhart4	0.0022996	(2.81)	−0.0025135	(−5.81)	0.0048096	(6.35)
FF5	0.0026698	(3.27)	−0.0023119	(−5.31)	0.0044491	(5.87)
Panel B (Monday long minus strategy returns)						
	Monday long	***T*-statistics**	**Monday short**	***T*-statistics**	**Monday long–short**	***T*-statistics**
CAPM	0.000831	(2.18)	−0.0021325	(−4.15)	0.0029635	(5.44)
FF3	0.0008291	(2.15)	−0.0024029	(−4.45)	0.0032319	(5.91)
Carhart4	0.0004254	(2.59)	−0.0023575	(−4.30)	0.0027829	(5.24)
FF5	0.000181	(2.25)	−0.0023689	(−4.26)	0.0025499	(4.81)

This table examines long minus short monthly portfolio returns based on Bid-Ask spread (Corwin and Schultz, 2012) to invest in a particular day of the week. Panel A reports long minus short strategy returns on Friday, and panel B reports long minus short strategy returns on Monday. The panels report the values of Alpha for CAPM, the Fama and French three-factor model, the Carhart four-factor model, and the Fama and French five-factor model. Portfolios are equally weighted, and values of t-statistics are adjusted for autocorrelation and heteroscedasticity.

respectively. Meanwhile, panel B of **Table 3** is also consistent with mood prediction and provides comparatively lower long minus short strategy returns on Monday than Friday. The magnitude difference between Friday and Monday portfolio strategy returns are much higher for Amihud's illiquid measure, whereas the Bid-Ask spread anomaly provides almost double long minus short strategy returns on Friday than Monday.

Friday Minus Monday Strategy Returns

Table 3 presents more direct estimations of the sentimental hypothesis by comparing Friday long minus short strategy returns and Monday long minus short strategy returns. The magnitude difference between both days varies from 102 basis points to 130 basis points for all estimations. For instance, by observing the CAPM alpha of Amihud's illiquidity measure from Panel A, Fridays account for more than 132 basis points excess returns for each month, and it means that by following this strategy investors can gain a 15.84% yearly excess return. Results for the Bid-Ask spread anomaly are also consistent with the theory, and Friday earns higher monthly strategy returns than Monday. Our results are not only striking in terms of magnitude, but our results are consistent with the findings of mood theory that Friday sustained higher returns in comparison to Monday, and these findings are consistent for both anomalies, and results are presented in Panel A and B of **Table 3**.

Asymmetry in Long Leg

Panels A and B of **Table 4** examine the returns difference of the long leg between Friday and Monday for both anomalies. The mispricing story based on sentimental hypothesis gives a prediction of asymmetry when comparing the Friday long leg

TABLE 3 | Panels **A** and **B**: Friday minus Monday strategy returns (Amihud's illiquidity measure and Bid-Ask spread measure).

Panel A (Friday minus Monday strategy returns of Amihud's illiquidity measure)						
	Friday long–short	***T*-statistics**	**Monday long–short**	***T*-statistics**	**Friday–Monday**	***T*-statistics**
CAPM	0.0113662	(3.15)	−0.0016774	(−2.29)	0.0130436	(3.48)
FF3	0.0095726	(2.45)	−0.002198	(−2.69)	0.0117706	(3.09)
Carhart4	0.0079358	(2.92)	−0.0022696	(−2.71)	0.0102054	(2.67)
FF5	0.0074951	(2.87)	−0.0027626	(−3.09)	0.0102577	(2.62)
Panel B (Friday minus Monday strategy returns of Bid-Ask spread measure)						
	Friday long–short	***T*-statistics**	**Monday long–short**	***T*-statistics**	**Friday–Monday**	***T*-statistics**
CAPM	0.0046863	(6.34)	0.0029635	(5.44)	0.0017229	(2.17)
FF3	0.0049322	(6.60)	0.0032319	(5.91)	0.0017003	(2.10)
Carhart4	0.0048096	(6.35)	0.0027829	(5.24)	0.0020267	(2.49)
FF5	0.0044491	(5.87)	0.0025499	(4.81)	0.0018993	(2.27)

This table examines Friday minus Monday monthly portfolio returns based on Amihud's illiquidity measure (Panel A) and the Bid-Ask spread measure (Panel B) to invest on a particular day. The table reports the values of Alpha for CAPM, the Fama and French three-factor model, the Carhart four-factor model, and the Fama and French five-factor model. Portfolios are equally weighted, and values of t-statistics are adjusted for autocorrelation and heteroscedasticity.

TABLE 4 | Panels **A** and **B**: asymmetry in long leg (Amihud's Illiquidity measure and Bid-Ask spread measure).

Panel A (asymmetry in long leg of Amihud's illiquidity measure)						
	Friday long	***T*-statistics**	**Monday long**	***T*-statistics**	**Friday long–Monday long**	***T*-statistics**
CAPM	0.0113672	(2.91)	−0.0004678	(−3.35)	0.011835	(3.13)
FF3	0.0094585	(2.40)	−0.0011018	(−2.81)	0.0105604	(2.75)
Carhart4	0.0077422	(2.49)	−0.0013681	(−2.00)	0.00923	(2.38)
FF5	0.0132384	(2.69)	−0.0018303	(−2.34)	0.0093422	(2.36)
Panel B (asymmetry in long leg of Bid-Ask spread measure)						
	Friday long	***T*-statistics**	**Monday long**	***T*-statistics**	**Friday long–Monday long**	***T*-statistics**
CAPM	0.0024509	(3.01)	0.000831	(2.18)	0.0024189	(1.51)
FF3	0.0023808	(2.88)	0.0008291	(2.15)	0.0023063	(1.42)
Carhart4	0.0022996	(2.81)	0.0004254	(2.59)	0.002154	(1.30)
FF5	0.0026698	(3.27)	0.000181	(2.25)	0.0018154	(1.09)

This table examines Friday monthly portfolio returns based on Amihud's illiquidity measure (Panel A) and the Bid-Ask spread measure (Panel B) to invest in the long leg on a particular day. The table reports the values of Alpha for CAPM, the Fama and French three-factor model, the Carhart four-factor model, and the Fama and French five-factor model. Portfolios are equally weighted, and values of t-statistics are adjusted for autocorrelation and heteroscedasticity.

with Monday's long leg. An explanation based on the sentiment explains that the displayed return trend should be endorsable to the speculative leg. Therefore, panel A and B show only the long leg for both anomalies since the speculative leg is the long leg for both measures. The return difference in long leg portfolios for both days is solely larger than the return of the long minus short portfolio. For example, focusing on the CAPM alpha of the Friday long minus the Monday long for the portfolio based on Amihud's illiquidity measure leads to an increase of 118 excess basis points strategy returns on Friday over Monday. To give a more straightforward explanation for this investment strategy, we can say that investors can earn 118 basis points excess returns by merely investing in the long leg of the portfolio based on Amihud's illiquid measure for only two days (take the long position on Friday, shorten it on Monday, and the rest of the days can be used to invest in risk-free investment).

Robustness Test

Macroeconomic news effect

It is unlikely that good or bad news has a systematic pattern of being announced on a particular day of the week, but it is possible that a cross-sectional effect is generated due to these macroeconomic news announcement effects. For instance, illiquid stocks are sometimes more sensitive toward these announcements than others. Therefore, we gathered data on the monthly macroeconomic announcement dates by following (Savor and Wilson, 2013) and took the announcement dates data of the CPI (Consumer Price Index) and PPI (Producer Price Index). We focused on the days when these figures are released. Panel A and B of **Supplementary Table S2** provide results of strategy returns for both anomalies when returns of particular dates are excluded from the sample. The results indicate that earlier patterns of cross-sectional returns for Friday and Monday are robust to the exclusion of macroeconomic announcement

dates. Thus, the results are not consistent with the explanation that the observed cross-sectional pattern is due to the impact of macroeconomic news announcements.

Firm-specific news impact

A possible explanation for this cross-sectional effect on a particular day could be the non-random timing of firm-specific news announcements (Guo and Huang, 2019). Therefore, to make this argument valid, speculative and non-speculative firms should have a systematic difference in the announcements of good and bad news. To verify this argument, we took data for announcement dates of earning and dividend declarations at the firm level. Literature has suggested that earning announcement dates are off by some days (Dellavigna and Pollet, 2009). We excluded two days before the announcement and two days post-announcement by considering the conservative approach. This approach was beneficial because a week has five working days, and the exclusion of $t - 2$ and $t + 2$ days ensured equal elimination for each day of the week. Panel A and B of **Supplementary Table S3** examine the results, with the exclusion of $t - 2$ to $t + 2$ dates, of earnings and dividend announcements. The results indicate that the magnitude difference of strategy returns has no significant change, and findings of both anomalies are not consistent with the explanation that cross-sectional variation of returns on Friday and Monday is derived by firm-specific news.

Impact of institutional ownership

Firms with high institutional ownership are expected to be less effected by sentiment, and, at the same time, firms with less institutional ownership and high individual ownership structures are more sensitive to sentiment. Therefore, we have further divided existing portfolios on the basis that institutional investment and firms that fall below the median provide a robust explanation: cross-sectional variation in stock returns is higher for stocks that have less institutional ownership because stocks with less institutional ownership are prone toward investor sentiment. **Supplementary Table S4** provides only the results for both anomalies with the firms that fall below the median value of institutional ownership. The results indicate that firms with low institutional investment and more illiquid are more sensitive to sentiment and provide higher returns on Friday than Monday.

Discussion

The literature of psychology predicts and gives robust findings related to mood elevation on Friday over Monday, and this causes higher returns for speculative stocks on Fridays. These robust findings also predict that returns will be relatively low on Monday in parallel with the decreasing mood on Monday. Hence, a new strategy is emerging with the prediction that anomaly returns will be higher on Fridays for those where the speculative leg is the long leg. Results have confirmed the prediction that was found in the data and examined long minus short returns for Amihud's illiquid measure and the Bid-Ask spread anomaly on Friday and the long minus short returns of illiquid anomaly on Monday. Striking results emerged when the Friday minus Monday estimation provided higher alpha values for the portfolio constructed on the basis of Amihud's illiquid measure for all models. The results were not only striking in terms of magnitude, but they were also consistent with the findings of mood theory that Friday sustained higher returns in comparison to Monday, and these findings were consistent for both anomalies.

The findings of difference in the long leg for both anomalies were also consistent with the sentiment, based on investor mood, that the day of the week effect prevails in cross-sectional returns for the speculative leg of the portfolio investment. Therefore, it was again confirmed that the speculative leg earns higher returns on Friday than on Monday for the same speculative leg. Our findings were also in accordance with the explanation that the observed pattern of the cross-sectional effect on a particular day was not explained by the non-random timing of firm-specific news announcements, and they were inconsistent with the finding that the cross-sectional effect is generated due to these macroeconomic news announcement effects, as it is unlikely that good or bad news had a systematic pattern to be announced on a particular day of the week. We have also performed an additional robust test by dividing the firms into two sections on the basis of institutional ownership, and our results were again consistent with the portfolio returns of speculative stocks. The findings indicate that Friday earns higher stock returns for the portfolio of the firms that fall in the lower median because firms that have less institutional investment (and thus more individual ownership) are more prone to sentiment.

CONCLUSION

The study has found a strong, predictable cross-sectional variation in illiquid stocks across the days of the week. Although the Chinese market has a different investment culture and political environment, our results are consistent with the findings of Birru (2018). The study found that the speculative leg of illiquid stocks earned higher returns on Friday than Monday in comparison to non-speculative stocks. Our results are also concurrent with firm-specific news announcements, macroeconomic news announcements, and monthly portfolio returns.

Psychology literature has found a consistent variation in mood across the days of the week, where mood increases on Friday and decreases on Monday. Our results regarding the cross-sectional pattern in illiquid stocks were consistent with the psychology findings, and returns are relatively higher on Friday when the mood is higher and lower on Monday when the mood is lower. Moreover, the study provides different strategies to earn excess returns across the days of the week by investing in illiquid stocks. The findings of the paper are an extension of the evidence of Baker and Wurgler (2012) that during the high-sentiment time investors tend to have low demand for safe investments, whereas, during the low sentiment time, investors tend to have a flight toward quality. Our study gives a more specific explanation that stocks are sensitive to sentiment, and we provide evidence of cross-sectional variations of returns on particular days by linking the speculative leg of illiquid stocks with mood theory from psychology literature. Additionally, our research will help academicians and practitioners in making investment strategies for investment or future research.

There are several limitations to the study: this study is based upon a Chinese dataset, and the structure of the Chinese stock market is quite different to that of the rest of the world. Therefore, the results of the study may not be generalized to other markets. The Chinese market has a strong government influence, and this study can be further tested by segregating the state-owned and non-state-owned enterprises. For future directions, this research can also be expanded by incorporating the different dimensions of emotions that affect an individual's mood, e.g., valence, arousal, state-related, and trait-related emotions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any qualified researcher.

AUTHOR CONTRIBUTIONS

QY supervised this study and involved with the methodology section, data collection, and made revisions to the manuscript. TY performed the formal analysis, the methodology of the manuscript, and applied techniques through software. QA wrote, reviewed, and edited the draft, and helped with the data collection. YA proofread the manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00173/full#supplementary-material

REFERENCES

Amihud, Y. (2002). Illiquidity and stock returns: cross-section and time-series effects. *J. Financ. Mark.* 5, 31–56. doi: 10.1016/S1386-4181(01)00024-6

Baker, M., and Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *J. Finance* 61, 1645–1680. doi: 10.1111/j.1540-6261.2006.00885.x

Baker, M., and Wurgler, J. (2007). Investor sentiment in the stock market. *J. Econ. Perspect.* 21, 129–152. doi: 10.1257/jep.21.2.129

Baker, M., and Wurgler, J. (2012). Comovement and predictability relationships between bonds and the cross-section of stocks. *Rev. Asset Pricing Stud.* 2, 57–87. doi: 10.1093/rapstu/ras002

Birru, J. (2018). Day of the week and the cross-section of returns. *J. Financ. Econ.* 130, 182–214. doi: 10.1016/j.jfineco.2018.06.008

Clore, G., Schwarz, N., and Conway, M. (1994). "Affective causes and consequences of social information processing," in *Handbook of Social Cognition: Basic Processes; Applications*, eds R. S. Wyer, Jr. and T. K. Srull (New York, NY: Lawrence Erlbaum Associates), 323–417.

Corwin, S. A., and Schultz, P. (2012). A simple way to estimate bid-ask spreads from daily high and low prices. *J. Finance* 67, 719–760. doi: 10.1111/j.1540-6261.2012.01729.x

Cross, F. (1973). The behavior of stock prices on fridays and mondays. *Financ. Anal. J.* 29, 67–69. doi: 10.2469/faj.v29.n6.67

Dellavigna, S., and Pollet, J. M. (2009). Investor inattention and friday earnings announcements. *J. Finance* 64, 709–749. doi: 10.1111/j.1540-6261.2009.01447.x

Forgas, J. P. (1995). Mood and judgment: the affect infusion model (AIM). *Psychol. Bull.* 117:39. doi: 10.1037/0033-2909.117.1.39

French, K. R. (1980). Stock returns and the weekend effect. *J. Financ. Econ.* 8, 55–69. doi: 10.1016/0304-405X(80)90021-5

Ghulam, S., Shah, M., Muddassar, S., Fareed, Z., Ateeq ur Rehman, M., Maqbool, A., et al. (2019). Whether CEO succession via hierarchical jumps is detrimental or blessing in disguise? Evidence from chinese listed firms. *Zagreb Int. Rev. Econ. Bus.* 22, 23–42.

Gibbons, M. R., and Hess, P. (1981). Day of the week effects and asset returns. *J. Bus.* 54, 579–596.

Goetzmann, W. N., Kim, D., Kumar, A., and Wang, Q. (2015). Weather-induced mood, institutional investors, and stock returns. *Rev. Financ. Stud.* 28, 73–111. doi: 10.1093/rfs/hhu063

Guo, Y., and Huang, M. (2019). Media heterogeneity and post-earnings announcement drift: evidence from China. *Account. Finance* 59, 3223–3252. doi: 10.1111/acfi.12570

Hegtvedt, K. A., and Parris, C. L. (2014). "Emotions in justice processes," in *Handbook of the Sociology of Emotions*, Vol. II, eds J. E. Stets, and J. H. Turner (Cham: Springer), 103–125. doi: 10.1007/978-94-017-9130-4_6

Helliwell, J. F., and Wang, S. (2014). Weekends and subjective well-being. *Soc. Indic. Res.* 116, 389–407. doi: 10.1007/s11205-013-0306-y

Kong, D., Qin, N., Feng, Z., and Liu, S. (2019). Betting on temperature: psychological bias in insurance purchases. *Account. Finance* 59, 2993–3027. doi: 10.1111/acfi.12565

Luo, R., Liu, Y., and Lan, W. (2019). A penalized expected risk criterion for portfolio selection. *China Finance Rev. Int.* 9, 386–400. doi: 10.1108/cfri-12-2017-0226

Ma, D., and Tanizaki, H. (2019). On the day-of-the-week effects of Bitcoin markets: international evidence. *China Finance Rev. Int.* 9, 455–478. doi: 10.1108/cfri-12-2018-0158

Rasheed, M. S., Noreen, U., Sheikh, M. F., and Yousaf, T. (2016). CAPM and idiosyncratic risk using two-pass model: evidence from the karachi stock market. *J. Commer.* 8, 25–38.

Robins, R. P., and Smith, G. P. (2016). No more weekend effect. *Crit. Finance Rev.* 5, 417–424. doi: 10.1561/104.00000038

Rossi, A. S., and Rossi, P. E. (1977). Body time and social time: mood patterns by menstrual cycle phase and day of the week. *Soc. Sci. Res.* 6, 273–308. doi: 10.1016/0049-089X(77)90013-8

Sarfraz, M., Qun, W., Shah, S. G. M., and Fareed, Z. (2019). Do hierarchical jumps in CEO succession invigorate innovation? *Evid. Chin. Econ. Sustainabil.* 11, 1–21.

Savor, P., and Wilson, M. (2013). How much do investors care about macroeconomic risk? Evidence from scheduled economic announcements. *J. Financ. Quant. Anal.* 48, 343–375. doi: 10.1017/S0022109013000015X

Shah, S. G. M., Tang, M., Sarfraz, M., and Fareed, Z. (2019). The aftermath of CEO succession via hierarchical jumps on firm performance and agency cost: evidence from Chinese firms. *Appl. Econ. Lett.* 26, 1744–1748. doi: 10.1080/13504851.2019.1593932

Stone, A. A., Schneider, S., and Harter, J. K. (2012). Day-of-week mood patterns in the United States: on the existence of 'Blue Monday', 'Thank God it's Friday' and weekend effects. *J. Posit. Psychol.* 7, 306–314. doi: 10.1080/17439760.2012.691980

Yang, T., Liu, J., Ying, Q., and Yousaf, T. (2019). Media coverage and sustainable stock returns: evidence from China. *Sustainability* 11:2335. doi: 10.3390/su11082335

Ying, Q., Yousaf, T., Akhtar, Y., and Rasheed, M. S. (2019). Stock investment and excess returns: a critical review in the light of the efficient market hypothesis. *J. Risk Financ. Manag.* 12, 1–22.

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Demonstrating the Impact of Cognitive CEO on Firms' Performance and CSR Activity

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One aspect of entrepreneurship psychology also clarifies individual characteristics. Drawing from entrepreneurship psychology, the concept of a cognitive CEO has been formulated using the DAE statistical technique. The study elucidates that cognitive CEOs not only boost SME performance but also invigorate CSR activity. Data for listed SMEs for the years 2016–2018 are analyzed through the panel regression technique. Significantly, the study demonstrates that CEO age is positively interlinked with the growth and CSR activity of the firm. Moreover, the empirical underpinning of the results also reveals that state-owned enterprises and firms with high total assets prefer cognitive CEOs, who accelerate the firm's value and invigorate CSR activity. The number of independent directors is analyzed as a moderator and is concluded to be an intensifier for both SME growth and CSR activity. Finally, 2SLS instrumental panel regression is used to validate the veracity of the empirical results.

Keywords: corporate governance, entrepreneurship psychology, cognitive CEO, SME performance, CSR activity

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INTRODUCTION

The extant literature signifies that excellent corporate governance influences the performance of firms. Significantly, organizational support can mitigate adverse psychological factors among employees (Sarfraz et al., 2019a). However, scant literature has examined the psychological aspects of the upper echelon, specifically among small–medium-sized enterprises (Palmer et al., 2019). Meanwhile, entrepreneurial behavior has been studied using individual attributes (education, age, etc.), showing that these can have a significant impact on the firm's growth (De Jong et al., 2015). The literature on entrepreneurship psychology has signified through empirical analysis that the role of CEO is pivotal in SMEs and venture capital (Ensley et al., 2002; Lewis, 2015; Miao et al., 2019) while taking strategic decisions.

Specifically, CEO psychology has been demonstrated via a CEO's specific attributes, which can affect the firm's performance asymmetrically (Kim et al., 2016; Ou et al., 2018; Park et al., 2018). Certainly, CEO attributes affect different aspects of an organization that are interlinked with the firm's growth and sustainability. In this regard, analyses have been performed on the impact of CEO attributes on a firm's cash holdings, innovation, corporate social responsibility, and earnings management (Francis et al., 2008; Orens and Reheul, 2013; Chen et al., 2014; Zhang et al., 2017; García-Sánchez and Martínez-Ferrero, 2019).

CEO characteristics illustrate the innovative capacity of the firm (De Visser and Faems, 2015). Extant studies have found that CEO cognitive style is interlinked with innovative capacity, but the present study contributes new insights by formulating the concept of a cognitive CEO and analyzing its effects on the performance and CSR activity of a firm.

The social cognitive theory emphasizes the individual characteristics that can either embellish or blemish performance through environmental factors (Staples and Webster, 2007). Additionally, leaders who adopt cognitive strategies experience emphatic performance enhancement (Torrence and Connelly, 2019). Meanwhile, cognitive psychology emphasizes that cognition synchronizes the brain to proceed properly (Barsalou, 2014), which ultimately assists the individual in making the right decision. A CEO's cognitive style also illustrates that he/she is a problem solver when confronting uncertainty within the organization. Moreover, an innovative style identifies a strategy that is related to problem-solving (Sadler-Smith and Badger, 1998). Hence, our independent variable, cognitive CEO, has been formulated on the basis of comparative analysis of the intangible assets ratio of an incumbent CEO along with his/her specific characteristics related to knowledge.

Cognition has been considered a significant tool that augments the innovative capabilities of employees (Chen X. et al., 2019), which necessarily escalates a firm's growth. In emerging countries, innovative capability has been examined under the auspices of the managerial cognition perspective and environmental strategies. Innovative capabilities are weaker where there is excessive governmental control (Yang et al., 2019). We have selected Chinese firms for this empirical analysis because of their distinguishing characteristics. China adopted a market economy over the last few decades, and the corporate governance mechanism is still quite novel. CSRC[1] has compelled the organizations to have a specific number of independent directors to enhance corporate governance (Wang et al., 2019). Meanwhile, despite excessive governmental interference in Chinese firms and SMEs,[2] even small–medium enterprises are growing rapidly while contributing to the Chinese GDP (Cui et al., 2019).

The objective of the study is to contemplate whether a CEO with specific characteristics related to experience and knowledge can be conducive to a firm's growth. Moreover, it considers whether cognitive ability also orientates the CEO toward adopting CSR activity or not. It is also significant to comprehend the role of independent directors under the auspices of a cognitive CEO.

Our study contributes theoretically and empirically. Firstly, we formulate the variable "cognitive CEO" by executing the DAE statistical technique. Secondly, we demonstrate the impact of a cognitive CEO on SME performance. Thirdly, we also contemplate the impact of a cognitive CEO on corporate social responsibly activity. Fourthly, the role of independent directors examined as a moderator of both performance and CSR activity. Last, we execute 2SLS instrumental panel regression, which indicates that our results are authentic and reliable.

THEORETICAL BACKGROUND AND HYPOTHESIS FORMULATION

The extant literature has revealed that corporate governance not only influences a firm's growth but also affects corporate social responsibility (Bhagat and Bolton, 2019; Zhou, 2019). One study has indicated that corporate social responsibility even influences employee performance in SMEs (Sarfraz et al., 2018a) while, conversely, another emphasizes the moderating role of CSR, which affects project financing (Sarfraz et al., 2018b). However, the CEO is a pivotal figure who can orientate the firm toward adopting CSR measures. The prior literature has identified CEO attributes that have strongly affected both firm performance and CSR disclosure (García-Sánchez and Martínez-Ferrero, 2019; Hegde and Mishra, 2019). The psychological factors that are related to CEO personality have also been analyzed, revealing their strong impact on organizational risk (Benischke et al., 2019).

An enormous body of literature exists on how managerial cognition relates to environmental strategies, but few studies have been found that signify how the evolution of managerial cognition interlinks with environmental strategies (Yang et al., 2019). Moreover, a study has demonstrated that the intensity of motivation also invigorates cognitive capability (Shepherd and Patzelt, 2018), which ultimately assists individuals in taking drastic steps under unpredictable circumstances. Additionally, it has been witnessed that cognitive behavior under the umbrella of the social aspect does influence strategic decisions (Bromiley and Rau, 2016), as it compels the upper echelon to work diligently for the firm's growth.

More precisely, prior research on CEOs can be segregated into three categories. First, firm growth and CEO personality in terms of the five personality aspects (conscientiousness, emotional stability, agreeableness, extraversion, and openness) have been examined (Peterson et al., 2003; Nadkarni and Herrmann, 2010). Second, some studies have emphasized specific CEO attributes, including both positive and negative aspects (self-evaluation, charisma, humility, narcissism, overconfidence, and hubris) (Chatterjee and Hambrick, 2007), that influence different features of the firm asymmetrically. Third, some studies have revealed that CEO values (e.g., collectivism, novelty, self-direction, benevolence, and organizational identification) not only influence the growth of a firm but also its corporate social responsibility. Specifically, a recent study has witnessed that CEO cognition also escalates a firm's performance even if the firm has entered into a declining phase (Liang et al., 2018). Hence, we can encapsulate the above research to formulate the hypothesis that a cognitive CEO should enhance a firm's growth.

H1: A cognitive CEOs boosts the firm's growth.

It is at the CEO's discretion to either adopt innovative measures or to disclose CSR activities (Davidson et al., 2018).

[1]The Chinese Security Regulatory Council compelled Chinese firms to have a minimum of three independent directors among board members to enhance corporate governance (Liu et al., 2015).

[2]According to Zhao et al. (2013), 99% of Chinese chemical firms are SMEs, which means that corporate social responsibility is the main concern for these companies.

Interestingly, prior studies have found interlinks of firms' CSR activities with CEO demographics and specific characteristics (Borghesi et al., 2014; Davidson et al., 2018). Further, a recent study on materialistic CEOs has demonstrated that they are less oriented toward corporate social responsibility when compared to non-materialistic CEOs (Davidson et al., 2018). However, our variable "cognitive CEO" is based on variables named "CEO experience, CEO education, number of meetings attended by CEO, and goodwill," which have been contemplated by some studies and revealed to have a positive relationship with CSR activity (Koehn and Ueng, 2010; Huang, 2013; Golden et al., 2017; Chen W.T. et al., 2019). This guides us to the second hypothesis.

H2: Cognitive CEOs enhance CSR activity.

Independent Directors as a Moderator for Cognitive CEO and Firm Performance, CSR

Chinese organizations have enhanced their corporate structure via introducing a specific number of independent directors (Wang et al., 2019), who have strengthened the firms' growth through constant vigilance (Tang et al., 2016). Some studies have found that having a high proportion of independent directors mitigates organizational risk (Li et al., 2017), which ultimately invigorates the firm's profitability. Meanwhile, the presence of independent directors is also conducive to CSR disclosure (Fernández-Gago et al., 2018). Arguably, independent directors are not only representatives of minority shareholders but are also stakeholders that compel the CEOs to promote CSR activity (García-Sánchez and Martínez-Ferrero, 2018). Therefore, the role of the independent director as a moderator should enhance a firm's growth and CSR activity emphatically. Thus, the following hypotheses are made:

H3a: Independent directors as a moderator augment the firm's performance.
H3b: Independent directors as a moderator intensify the CSR activity.

DATA COLLECTION AND MEASURES

We have selected SME data listed on Chinese stock exchanges from 2016 through 2018. Data has been accumulated from CSMAR and WIND following the extant literature (Jiang et al., 2013; Zhang and Qu, 2016; McGuinness et al., 2017). The independent variable, cognitive CEO, has been formulated via analyzing the five variables. Following the extant literature, cognition is defined as the knowledge that has been gained through experience and the senses (Chen X. et al., 2019). Consequently, a CEO can utilize his or her cognition to make the right decision. Therefore, we have selected these variables (CEO experience, CEO compensation, the number of meetings attended by the CEO, goodwill, and intangible assets ratio) that signify his/her cognitive ability. CEO tenure, CEO compensation, goodwill, and the number of meetings attended by the CEO represent how much knowledge, either tacit knowledge or working knowledge, the incumbent CEO will gain, which will ultimately affect the intangible assets of the company. Moreover, motivation is also a vigorous vehicle that boosts hidden capabilities to work with enthusiasm. In this regard, CEO compensation[3] has been included in formulating the cognitive CEO variable. The cognitive CEO variable has been formulated using the DAE[4] statistical technique. If the incumbent CEO performs better in terms of output (intangible assets ratio) with the given input (the above four variables), then he/she was deemed a cognitive CEO[5] and was assigned "1"; otherwise, he/she was assigned "0." Firstly, we have taken the logarithm of cognitive CEO and have assigned the value "1" if its logarithmic value is greater than the mean value; otherwise, it has been assigned the value "0." Mathematically, the cognitive CEO has been formulated as follows:

$$CCEO = \sum_{\rho=1}^{k} z_\rho x_{\rho m} \Big/ \sum_{\rho=1}^{q} k_\rho y_{\rho m}, \quad \text{where } \rho = 1, \ldots, n \qquad (1)$$

In Eq. 1, there are "q" inputs and "k" outputs. In this case, our output is the intangible assets ratio, whereas our inputs are CEO experience, CEO compensation, number of meetings attended by the CEO, and goodwill.

Equation 1 emphasizes that all input variables (CEO experience, CEO education, number of meetings attended by the

[3]CEO compensation has a positively significant impact on performance (Jian and Lee, 2015).

[4]DAE is a statistical technique used to demonstrate the relative efficiency of separable variables (Demerjian P. et al., 2012).

[5]Yuan et al. (2019) and Demerjian P.R. et al. (2012), analyzed the impact of CEO ability and manager ability, formulated on the basis of the DAE technique.

TABLE 1 | Formulation of CSR index.

	Attribute	Measurement
1	Whether the firm has indulged in social donation	Yes = 1, No = 0
2	Whether the firm has been verified by a third-party agency	Yes = 1, No = 0
3	Whether the firm refers to the GRI Sustainability Report Guide	Yes = 1, No = 0
4	Whether the firm discloses the protection of shareholders' rights	Yes = 1, No = 0
5	Whether the firm discloses the protection of creditors' rights	Yes = 1, No = 0
6	Whether the firm discloses the protection of employee rights	Yes = 1, No = 0
7	Whether the firm discloses the protection of supplier rights	Yes = 1, No = 0
8	Whether the firm discloses the protection of customers' and consumers' rights	Yes = 1, No = 0
9	Whether the firm discloses environmental and sustainable development	Yes = 1, No = 0
10	Whether the firm discloses public relations and social welfare undertakings	Yes = 1, No = 0
11	Whether the firm discloses the construction of a social responsibility system and improvement measures	Yes = 1, No = 0
12	Whether the firm discloses safety production content	Yes = 1, No = 0
13	Whether the firm discloses its shortcomings	Yes = 1, No = 0

TABLE 2 | Descriptive statistics.

Variable	Obs	Mean	SD	Min	Max
CSSR	1603	0.6007006	0.1178094	0.2307692	0.9230769
INDIR	1603	3.771678	1.214877	2	13
EPS	1601	0.3041771	0.8210663	−6.859921	17.53427
ROA	1602	0.0952036	2.735636	−6.776046	108.3657
ROI	1599	0.2689851	0.669638	−0.561306	11.85493
Leverage	1601	0.5408962	0.5428913	0.01561	11.50969
CCEO	1592	0.1011307	0.3015964	0	1
AGE	1592	0.0477387	0.2132798	0	1
LNTA	1601	22.30435	1.438454	14.94164	28.55011
FSZ	1601	7.698642	1.473436	1.609438	11.47645
Dual	1573	0.1862683	0.3894468	0	1
Fage	1603	15.80848	4.084944	0	27
SOE	1603	0.5046787	0.5001341	0	1

Table 2 *gives the descriptive statistics of the different variables. "Fage" represents firm age whereas "FSZ" indicates firm size. The descriptive statistics also witness that all variables have a relatively low standard deviation.*

CEO, goodwill) should perform very well, causing a boost in the intangible assets of the firm. Additionally, corporate social responsibility disclosure has been formulated in consideration of the 13 attributes. Though the prior literature (Sial et al., 2018), has formulated corporate social responsibility disclosure measures by emphasizing 11 attributes,[6] our CSR ratio has been formulated by considering 13 attributes (as presented in **Table 1**). Mathematically,

$$CSRR_{i,t} = \frac{\sum_{P=1}^{13} Z_{Pi,t}}{N} \quad \text{where } Z_{pi,t} \in \{0, 13\} \tag{2}$$

where "$Z_{pi,t}$" indicates the different attributes for different listed firms.

In **Table 1**, 13 attributes have been signified for the formulation of CSSR.

Further, following the extant literature (Jiang et al., 2013; Zhu et al., 2016; Ghulam et al., 2019; Sarfraz et al., 2019b; Shah et al., 2019), we have selected the control variables "EPS" (earnings per share), "AGE" (age of cognitive CEO), "Dual" (CEO having two offices), "SOE" (state-owned enterprise), "Firm Size" (logarithm of number of employees), "LNTA" (logarithm of total assets), "Fage" (firm age), and "Leverage."

[6] A prior study (Yuan et al., 2019) emphasized seven attributes related to reporting.

Empirical Models

The panel regression technique is the preferred method for analyzing longitudinal and cross-sectional data. Through confirmation of the Hausman test, fixed effect panel regression has been selected, which also captures the characteristics of unobservable variable characteristics. Mathematically, the panel regression is expressed as follows:

$$\begin{aligned} Performance_{it} = {} & \alpha_0 + \alpha_{1it} CCEO_{it} + \alpha_{2it} Dual_{it} + \alpha_{3it} AGE_{it} \\ & + \alpha_{4it} SOE_{it} + \alpha_{5it} Fage_{it} + \alpha_{6it} Firmsize_{it} \\ & + \alpha_{7it} lnTA_{it} + \alpha_{8it} Leverage_{it} + \alpha_{9it} EPS_{it} + \epsilon_{it} \end{aligned} \tag{3}$$

$$\begin{aligned} CSSR_{it} = {} & \alpha_0 + \alpha_{1it} CCEO_{it} + \alpha_{2it} Dual_{it} + \alpha_{3it} AGE_{it} \\ & + \alpha_{4it} SOE_{it} + \alpha_{5it} Fage_{it} + \alpha_{6it} Firmsize_{it} \\ & + \alpha_{7it} lnTA_{it} + \alpha_{8it} Leverage_{it} + \alpha_{9it} EPS_{it} + \epsilon_{it} \end{aligned} \tag{4}$$

$$\begin{aligned} Performance_{it} = {} & \alpha_0 + \alpha_{1it} (CCEO_{it} \times INDIR_{it}) + \alpha_{2it} Dual_{it} \\ & + \alpha_{3it} AGE_{it} + \alpha_{4it} SOE_{it} + \alpha_{5it} Fage_{it} \\ & + \alpha_{6it} Firmsize_{it} + \alpha_{7it} lnTA_{it} + \alpha_{8it} Leverage_{it} \\ & + \alpha_{9it} EPS_{it} + \epsilon_{it} \end{aligned} \tag{5}$$

$$\begin{aligned} CSRR_{it} = {} & \alpha_0 + \alpha_{1it} (CCEO_{it} \times INDIR_{it}) + \alpha_{2it} Dual_{it} \\ & + \alpha_{3it} AGE_{it} + \alpha_{4it} SOE_{it} + \alpha_{5it} Fage_{it} \\ & + \alpha_{6it} Firmsize_{it} + \alpha_{7it} lnTA_{it} + \alpha_{8it} Leverage_{it} \\ & + \alpha_{9it} EPS_{it} + \epsilon_{it} \end{aligned} \tag{6}$$

Equations 3 and 5 indicate the effect of a cognitive CEO on a firm's performance. "ROA" and "ROI" have been endorsed

TABLE 3 | Correlation matrix.

	CSSR	ROA	ROI	EPS	LEV	CCEO	AGE	LNTA	LNEMP	Dual	SOE
CSSR	1.000										
ROA	0.0059	1.000									
ROI	0.0021	−0.0048	1.000								
EPS	0.0079	0.3725	0.0326	1.000							
LEV	0.0134	−0.3012	−0.0209	−0.1959	1.000						
CCEO	0.039	0.0632	0.0859	−0.0212	0.032	1.000					
AGE	0.0131	0.0569	0.0042	−0.0235	0.0549	0.5472	1.000				
LNTA	−0.0352	0.0108	−0.0074	0.2364	−0.0200	−0.0420	−0.024	1.000			
FSZ	−0.0662	0.0052	−0.0030	0.1590	−0.0722	−0.0272	−0.028	0.4831	1.000		
Dual	0.0404	−0.0099	−0.0293	−0.0501	0.0339	−0.0067	0.009	−0.0697	−0.0619	1.000	
SOE	0.0676	−0.0133	−0.0093	0.0075	0.0082	0.0120	0.001	0.0751	0.0964	−0.0456	1
Fage	0.1948	0.0326	0.0282	0.0368	0.9020	0.0273	0.005	−0.0391	−0.1303	−0.0523	0.071

Table 3 *signifies that all variables are less correlated except "AGE (CEO age)" ("0.5472"), which is also acceptable for empirical analysis.*

as proxies for measuring the firm's performance (Lin and Lin, 2019; Shah et al., 2019). Additionally, Eqs 4 and 6 demonstrate the impact of a cognitive CEO on CSR activity. The interaction term ($CCEO_{it} \times INDIR_{it}$) in Eqs 5 and 6 indicates the effect of independent directors as a moderator of firm performance and CSR activity.

Empirical Results

In this section, the empirical results of panel regression (see Eqs 3–6) are presented. The authenticity of the results has also been assessed through 2SLS instrumental regression. Since cognition is based on knowledge, we have selected CEO technical education as an instrumental variable.[7] **Table 2** details the descriptive statistics. The variables "CCEO" (cognitive CEO), "Degree" (education), "AGE" (age of CEO), "Dual" (CEO having two offices), and "SOE" (state-owned enterprise) are dummy variables. Moreover, the number of observations is almost the same, although some variables have fewer observations due to missing data.

Table 3 illustrates the correlation between variables. The variable "AGE" has the correlation "0.5462," whereas all other variables have lower correlation values. Hence, there is no threat of the multicollinearity problem.

Table 4 reveals that a cognitive CEO (CCEO) boosted the firm's performance significantly (tenth row and third and fourth columns of **Table 3**). In the third column of **Table 4**, the coefficient of ROI is "0.118," whereas the coefficient of ROA is "0.0435" for a cognitive CEO (CCEO). The results support our first hypothesis (H1). Additionally, the variables "lnTA," "Fage," and "AGE" positively boosted firm growth. "SOE" is also positively significant, which indicates that having a cognitive CEO in a state-owned enterprise is highly advantageous for escalating firm growth. Meanwhile, the first row of columns

[7]The correlation between instrumental variable (CEO technical education) and cognitive CEO is "0.7863" while with CSSR is "0.0098," which satisfy the condition of an instrumental variable. The technical education is a dummy variable which equals "1" if the CEO has a degree related to economics, management sciences or law, and "0" otherwise (Ghulam et al., 2019).

TABLE 4 | 2SLS Instrumental regression (cognitive CEO and performance).

	(1)	(2)	(3)	(4)
Variables	**ROA**	**ROI**	**ROI**	**ROA**
CCEO*INDIR	0.0955**	0.436***		
	(0.0982)	(0.147)		
EPS	0.169***	0.0233	0.0230	0.169***
	(0.0118)	(0.0200)	(0.0200)	(0.0118)
Leverage	−0.176***	−0.0174	−0.0233	−0.177***
	(0.0172)	(0.0291)	(0.0292)	(0.0172)
AGE	0.146*	0.382**	0.335**	0.140*
	(0.0849)	(0.152)	(0.137)	(0.0798)
LNTA	0.0157*	0.00684*	0.00538*	0.0156*
	(0.00891)	(0.0151)	(0.0151)	(0.00890)
FSZ	−0.00617	0.00148	0.00179	−0.00609
	(0.00859)	(0.0146)	(0.0146)	(0.00860)
Dual	0.0126	−0.0384	−0.0352	0.0135
	(0.0235)	(0.0400)	(0.0402)	(0.0236)
SOE	0.00709*	0.0172*	0.00895*	0.00637*
	(0.0184)	(0.0311)	(0.0314)	(0.0184)
Fage	0.00413**	0.00382*	0.00374*	0.00351*
	(0.00231)	(0.00395)	(0.00395)	(0.00231)
CCEO			0.118***	0.0435**
			(0.0418)	(0.0242)
Constant	0.409**	0.295	0.298	0.409**
	(0.165)	(0.280)	(0.281)	(0.165)
Observations	1,555	1,551	1,551	1,555
R^2	0.204	0.090	0.203	0.203

*Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. **Table 4** reveals that "CCEO" (Cognitive CEO) and "CCEO*INDIR" are positively significant for "ROA" and "ROI." In **Table 4**, the coefficient values of "CCEO*INDIR" are "0.095**" and "0.436***," whereas the coefficient values of CCEO are "0.118**" and "0.409," respectively. Through comparison, it has been confirmed that, as a moderator, independent directors boost the firm's growth strongly. Meanwhile, the variables "Fage" (firm age), "SOE," "AGE" (CEO age), and "LNTA" (total assets) are positively significant.*

TABLE 5 | 2SLS Instrumental regression (cognitive CEO and CSR activity).

	(1)	(2)	(3)	(4)	(5)
Variables	**CSRR**	**CSRR**	**CSRR**	**CSRR**	**CSRR**
CCEO*INDIR	0.0244**	0.0170**	0.0169**		
	(0.0317)	(0.0274)	(0.0275)		
EPS	0.00135	0.00126	−0.000290	−0.000301	0.00130
	(0.00382)	(0.00382)	(0.00366)	(0.00366)	(0.00382)
Leverage	−0.00119	−0.000831			−0.00138
	(0.00555)	(0.00555)			(0.00557)
AGE	0.00784**	0.00919**	0.00902**	0.00675**	0.00522*
	(0.0274)	(0.0286)	(0.0286)	(0.0269)	(0.0258)
LNTA	7.15e-05*	6.51e-05*	0.000649**	0.000626*	4.54e-05*
	(0.00288)	(0.00288)	(0.00286)	(0.00286)	(0.00288)
FSZ	−0.00405	−0.00402	−0.00391	−0.00390	−0.00403
	(0.00278)	(0.00278)	(0.00277)	(0.00277)	(0.00278)
Dual	−0.00994	−0.00974	−0.0106	−0.0105	−0.00970
	(0.00761)	(0.00761)	(0.00761)	(0.00762)	(0.00762)
SOE	0.0149**	0.0153**	0.0141**	0.0144**	0.0140**
	(0.00594)	(0.00592)	(0.00593)	(0.00593)	(0.00595)
Fage	0.00528***	0.00526***	0.00520***	0.00522***	0.00530***
	(0.000747)	(0.000747)	(0.000745)	(0.000744)	(0.000747)
CCEO				0.00424**	0.00601**
				(0.00690)	(0.00783)
Constant	0.540***	0.540***	0.527***	0.527***	0.540***
	(0.0534)	(0.0534)	(0.0531)	(0.0531)	(0.0534)
Observations	1,555	1,555	1,556	1,556	1,555
R^2	0.181	0.181	0.180	0.180	0.181

*Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. **Table 5** reveals that CCEO and CCEO*INDIR are positively significant for CSR ratio (tenth and first row). Additionally, the variables "AGE," "Fage," "LNTA," and "SOE" are positively significant for CSSR.*

(1) and (2) indicates the coefficient values of the interaction term (cognitive CEO term and independent directors). The coefficient values of CCEO*INDIR (0.0955**, 0.436***, respectively, are greater than the coefficient value of CCEO (0.0435**, 0.118***, respectively), which indicates that the presence of independent directors assists even a cognitive CEO in escalating firm growth significantly. This result satisfies hypothesis H3a.

Table 5 signifies that a cognitive CEO promotes the disclosure of CSR activity [eleventh row and columns (4) and (5)]. Additionally, the interaction of a CCEO and independent directors enhances the CSR activity [first row and columns (1) and (3)]. Specifically, the coefficient values of CCEO*INDIR (0.0244, 0.0170, and 0.0169) are greater than the coefficient values of CCEO (0.00424 and 0.00601), which argues that the vigilance of independent directors has compelled the cognitive CEO to disclose the CSR activity. Moreover, the variables "SOE," "AGE," "LNTA," and "SOE" boost the CSR activity.

CONCLUSION

Chinese SMEs contribute more than 60% of Chinese GDP (Huang et al., 2016). Therefore, studying Chinese SMEs is worthwhile and necessary to divulge their secrets. Chinese firms are allegedly under the strict surveillance of the government, but their growth is strong and undeterred. Corporate governance among Chinese firms is novel, but its role is vital for sustainability. However, the role of the CEO is pivotal in making decisions and taking drastic steps under uncertain circumstances. In this regard, entrepreneurship psychology orientates the organizational theorist to contemplate the specific attributes of a CEO that can accelerate a firm's growth. Further, individual psychological aspects of a CEO also matter in adopting CSR measures, as they signify how much of a philanthropist the CEO is. Additionally, CSR disclosure elucidates whether a CEO is concerned about minority shareholders and stakeholders. The concept of a cognitive CEO is based on the idea of best utilization of knowledge (either tacit knowledge or working knowledge) that can assist him/her in achieving goals. Empirical results have unveiled that cognitive CEOs boost firms' growth and adoption of CSR. Further, cognitive CEOs perform extremely well under the vigilant surveillance of independent directors. Moreover, older CEOs endorse CSR disclosure and boost the firm's growth. Finally, firms like state-owned enterprises, mature firms, or firms acquiring large total assets show a positive relationship between performance and CSR disclosure. To summarize, this study recommends that firms should prefer CEOs who are mature, have technical knowledge (either economics, law, or engineering), and have long tenure, as they will boost performance and also disclose CSR activities. Further, this study has also suggested that having a specific number of independent directors will enhance performance through their vigilant surveillance.

Study Limitations

Although this study has contributed a lot, there are some specific limitations that could be addressed in future study. First, the cognitive CEO has been formulated using specific variables and could be reformulated by incorporating different variables. Second, the impact of a cognitive CEO should be demonstrated for different aspects of organizations (e.g., cash holding, earnings management, etc.). Last, it is recommended that the effectiveness of cognitive CEOs for United States or European firms be analyzed.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

All study procedures were approved by the Ethics Committee of the Hohai University and informed consent of the participations was implied through survey completion.

AUTHOR CONTRIBUTIONS

HL and SS conceived the study and were responsible for the design, and development of the data analysis. HL, YH, and AA were responsible for the data collection and analysis. SS and AA was responsible for the data interpretation. SS wrote the first draft of the manuscript. YH and IO reviewed the manuscript. All authors approved the manuscript.

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REFERENCES

Barsalou, L. W. (2014). *Cognitive Psychology: An Overview of Cognitive Scientists*. Hove: Psychology Press.

Benischke, M. H., Martin, G. P., and Glaser, L. (2019). CEO equity risk-bearing and strategic risk-taking: the moderating effect of CEO personality. *Strateg. Manag. J.* 40, 153–177. doi: 10.1002/smj.2974

Bhagat, S., and Bolton, B. (2019). Corporate governance and firm performance: the sequel. *J. Corp. Finance* 58, 142–168. doi: 10.1016/j.jcorpfin.2019.04.006

Borghesi, R., Houston, J. F., and Naranjo, A. (2014). Corporate socially responsible investments: CEO altruism, reputation, and shareholder interests. *J. Corp. Finance* 26, 164–181. doi: 10.1016/j.jcorpfin.2014.03.008

Bromiley, P., and Rau, D. (2016). Social, behavioural, and cognitive influences on upper echelons during the strategy process: a literature review. *J. Manag.* 42, 174–202. doi: 10.1177/0149206315617240

Chatterjee, A., and Hambrick, D. C. (2007). It's all about me: narcissistic chief executive officers and their effects on company strategy and performance. *Adm. Sci Q.* 52, 351–386. doi: 10.2189/asqu.52.3.351

Chen, S. S., Ho, K. Y., and Ho, P. H. (2014). CEO overconfidence and long−term performance following R&D increases. *Financial Manag.* 43, 245–269. doi: 10.1111/fima.12035

Chen, W. T., Zhou, G. S., and Zhu, X. K. (2019). CEO tenure and corporate social responsibility performance. *J. Bus. Res.* 95, 292–302. doi: 10.1016/j.jbusres.2018.08.018

Chen, X., Liu, J., Zhang, H., and Kwan, H. K. (2019). Cognitive diversity and innovative work behaviour: the mediating roles of task reflexivity and relationship conflict and the moderating role of perceived support. *J. Occup. Organ.i Psychol.* 92, 671–694. doi: 10.1111/joop.12259

Cui, Y., Zhang, Y., Guo, J., Hu, H., and Meng, H. (2019). Top management team knowledge heterogeneity, ownership structure and financial performance: evidence from Chinese IT listed companies. *Technol. Forecasting Soc. Change* 140, 14–21. doi: 10.1016/j.techfore.2018.12.008

De Jong, J. P., Parker, S. K., Wennekers, S., and Wu, C. H. (2015). Entrepreneurial behaviour in organizations: does job design matter? *Entrep. Theory Pract.* 39, 981–995. doi: 10.1111/etap.12084

De Visser, M., and Faems, D. (2015). Exploration and exploitation within firms: the impact of CEOs' cognitive style on incremental and radical innovation performance. *Creat. Innov. Manag.* 24, 359–372. doi: 10.1111/caim.12137

Demerjian, P., Lev, B., and McVay, S. (2012). Quantifying managerial ability: a new measure and validity tests. *Manag. Sci.* 58, 1229–1248. doi: 10.1287/mnsc.1110.1487

Demerjian, P. R., Lev, B., Lewis, M. F., and McVay, S. E. (2012). Managerial ability and earnings quality. *Accoun. Rev.* 88, 463–498. doi: 10.2308/accr-50318

Ensley, M. D., Pearson, A. W., and Amason, A. C. (2002). Understanding the dynamics of new venture top management teams: cohesion, conflict, and new venture performance. *J. Bus. Ventur.* 17, 365–386. doi: 10.1016/s0883-9026(00)00065-3

Fernández-Gago, R., Cabeza-García, L., and Nieto, M. (2018). Independent directors' background and CSR disclosure. *Corp. Soc. Responsib. Environ. Manag.* 25, 991–1001. doi: 10.1002/csr.1515

Francis, J., Huang, A. H., Rajgopal, S., and Zang, A. Y. (2008). CEO reputation and earnings quality. *Contemp. Account. Res.* 25, 109–147.

García-Sánchez, I. M., and Martínez-Ferrero, J. (2018). How do independent directors behave with respect to sustainability disclosure? *Corp. Soc. Responsib. Environ. Manag.* 25, 609–627. doi: 10.1002/csr.1481

García-Sánchez, I. M., and Martínez-Ferrero, J. (2019). Chief executive officer ability, corporate social responsibility, and financial performance: the moderating role of the environment. *Busi. Strategy Environ.* 28, 542–555.

Ghulam, S., Shah, M., Muddassar, S., Fareed, Z., Ateeq ur Rehman, M., Maqbool, A., et al. (2019). Whether CEO succession via hierarchical jumps is detrimental or blessing in disguise? Evidence from Chinese listed firms. *Zagreb Int. Rev. Econo. Bus.* 22, 23–42.

Golden, J., Sun, L., and Zhang, J. H. (2017). Corporate social responsibility and goodwill impairment. *Account. Public Interest* 18, 1–28. doi: 10.2308/apin-51971

Hegde, S. P., and Mishra, D. R. (2019). Married CEOs and corporate social responsibility. *J. Corp. Finance* 58, 226–246. doi: 10.1016/j.jcorpfin.2019.05.003

Huang, S. K. (2013). The impact of CEO characteristics on corporate sustainable development. *Corp. Soc. Responsib. Environ. Manag.* 20, 234–244. doi: 10.1002/csr.1295

Huang, W., Boateng, A., and Newman, A. (2016). The capital structure of Chinese listed SMEs: an agency theory perspective. *Small Bus. Econ.* 47, 535–550. doi: 10.1007/s11187-016-9729-6

Jian, M., and Lee, K. W. (2015). CEO compensation and corporate social responsibility. *J. Multinat. Financial Manag.* 29, 46–65. doi: 10.1016/j.mulfin.2014.11.004

Jiang, F., Huang, J., and Kim, K. A. (2013). Appointments of outsiders as CEOs, state-owned enterprises, and firm performance: evidence from China. *Pacific Basin Finance J.* 23, 49–64. doi: 10.1016/j.pacfin.2013.01.003

Kim, J. B., Wang, Z., and Zhang, L. (2016). CEO overconfidence and stock price crash risk. *Contemp. Account. Res.* 33, 1720–1749. doi: 10.1111/1911-3846.12217

Koehn, D., and Ueng, J. (2010). Is philanthropy being used by corporate wrongdoers to buy goodwill? *J. Manag. Gov.* 14, 1. doi: 10.1007/s10997-009-9087-8

Lewis, K. V. (2015). Enacting entrepreneurship and leadership: a longitudinal exploration of gendered identity work. *J. Small Busi. Manag.* 53, 662–682. doi: 10.1111/jsbm.12175

Li, T., Munir, Q., and Karim, M. R. A. (2017). The nonlinear relationship between CEO power and capital structure: evidence from China's listed SMEs. *Int. Rev. Econo, Finance* 47, 1–21. doi: 10.1016/j.iref.2016.09.005

Liang, X., Barker, V. L., and Schepker, D. J. (2018). Chief executive cognition, turnaround strategy and turnaround attempts of declining firms. *J. Change Manag.* 18, 304–326. doi: 10.1080/14697017.2018.1464046

Lin, H. C., and Lin, P. C. (2019). The interplay between CEO-TMT exchange level and differentiation: implications for firm competitive behaviours and performance. *J. Bus. Res.* 95, 171–181. doi: 10.1016/j.jbusres.2018.10.034

Liu, Y., Miletkov, M. K., Wei, Z., and Yang, T. (2015). Board independence and firm performance in China. *J. Corp. Finance* 30, 223–244. doi: 10.1016/j.jcorpfin.2014.12.004

McGuinness, P. B., Vieito, J. P., and Wang, M. (2017). The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *J. Corp. Finance* 42, 75–99. doi: 10.1016/j.jcorpfin.2016.11.001

Miao, Q., Eva, N., Newman, A., and Cooper, B. (2019). CEO entrepreneurial leadership and performance outcomes of top management teams in entrepreneurial ventures: the mediating effects of psychological safety. *J Small Bus. Manag.* 57, 1119–1135. doi: 10.1111/jsbm.12465

Nadkarni, S., and Herrmann, P. O. L. (2010). CEO personality, strategic flexibility, and firm performance: the case of the Indian business process outsourcing industry. *Acad. Manag. J.* 53, 1050–1073. doi: 10.5465/amj.2010.54533196

Orens, R., and Reheul, A. M. (2013). Do CEO demographics explain cash holdings in SMEs? *Eur. Manag. J.* 31, 549–563. doi: 10.1016/j.emj.2013.01.003

Ou, A. Y., Waldman, D. A., and Peterson, S. J. (2018). Do humble CEOs matter? An examination of CEO humility and firm outcomes. *J. Manag.* 44, 1147–1173. doi: 10.1177/0149206315604187

Palmer, C., Niemand, T., Stöckmann, C., Kraus, S., and Kailer, N. (2019). The interplay of entrepreneurial orientation and psychological traits in explaining firm performance. *J. Bus. Res.* 94, 183–194. doi: 10.1016/j.jbusres.2017.10.005

Park, J. H., Kim, C., Chang, Y. K., Lee, D. H., and Sung, Y. D. (2018). CEO hubris and firm performance: exploring the moderating roles of CEO power and board vigilance. *J. Bus. Ethics* 147, 919–933. doi: 10.1007/s10551-015-2997-2

Peterson, R. S., Smith, D. B., Martorana, P. V., and Owens, P. D. (2003). The impact of chief executive officer personality on top management team dynamics: one mechanism by which leadership affects organizational performance. *J. f Appl. Psychol.* 88:795. doi: 10.1037/0021-9010.88.5.795

Sadler-Smith, E., and Badger, B. (1998). Cognitive style, learning and innovation. *Technol. Anal. Strategic Manag.* 10, 247–266. doi: 10.1080/09537329808524314

Sarfraz, M., Qun, W., Abdullah, M. I., and Alvi, A. T. (2018a). Employees' perception of corporate social responsibility impact on employee outcomes: mediating role of organizational justice for small and medium enterprises (SMEs). *Sustainability* 10:2429. doi: 10.3390/su10072429

Sarfraz, M., Qun, W., Hui, L., and Abdullah, M. I. (2018b). Environmental risk management strategies and the moderating role of corporate social responsibility in project financing decisions. *Sustainability* 10:2771. doi: 10.3390/su10082771

Sarfraz, M., Qun, W., Sarwar, A., Abdullah, M. I., Imran, M. K., and Shafique, I. (2019a). Mitigating effect of perceived organizational support on stress in the presence of workplace ostracism in the Pakistani nursing sector. *Psychol. Res. Behav. Manag.* 12:839. doi: 10.2147/PRBM.S210794

Sarfraz, M., Qun, W., Shah, S. G. M., and Fareed, Z. (2019b). Do hierarchical jumps in CEO succession invigorate innovation? Evidence from the Chinese economy. *Sustainability* 11:2017. doi: 10.3390/su11072017

Shah, S. G. M., Tang, M., Sarfraz, M., and Fareed, Z. (2019). The aftermath of CEO succession via hierarchical jumps on firm performance and agency cost: evidence from Chinese firms. *Appl. Econ. Lett.* 26, 1–5.

Shepherd, D. A., and Patzelt, H. (2018). "Motivation and entrepreneurial cognition," in *Entrepreneurial Cognition* (Cham: Palgrave Macmillan), 51–103. doi: 10.1007/978-3-319-71782-1_3

Sial, M., Zheng, C., Khuong, N., Khan, T., and Usman, M. (2018). Does firm performance influence corporate social responsibility reporting of Chinese listed companies? *Sustainability* 10:2217. doi: 10.3390/su10072217

Staples, D. S., and Webster, J. (2007). Exploring traditional and virtual team members'"best practices": a social cognitive theory perspective. *Small Group Res.* 38, 60–97. doi: 10.1177/1046496406296961

Tang, X., Lin, Y., Peng, Q., Du, J., and Chan, K. C. (2016). Politically connected directors and firm value: Evidence from forced resignations in China. *North Am. J,. Econ. Finance* 37, 148–167. doi: 10.1016/j.najef.2016.04.001

Torrence, B., and Connelly, S. (2019). Emotion regulation tendencies and leadership performance: an examination of cognitive and behavioral regulation strategies. *Front. Psychol.* 10:1486. doi: 10.3389/fpsyg.2019.01486

Wang, L., Liu, Q., and Hanazaki, M. (2019). Corporate board structure and corporate performance: empirical analysis of listed companies in China. *Fudan J. Hum. Soc. Sci.* 12, 137–175. doi: 10.1007/s40647-018-0232-0

Yang, D., Wang, A. X., Zhou, K. Z., and Jiang, W. (2019). Environmental strategy, institutional force, and innovation capability: a managerial cognition perspective. *J. Bus. Ethics* 159, 1147–1161. doi: 10.1007/s10551-018-3830-5

Yuan, Y., Tian, G., Lu, L. Y., and Yu, Y. (2019). CEO ability and corporate social responsibility. *J. Bus. Ethics* 157, 391–411.

Zhang, H., Ou, A. Y., Tsui, A. S., and Wang, H. (2017). CEO humility, narcissism and firm innovation: a paradox perspective on CEO traits. *Leadersh. Q.* 28, 585–604. doi: 10.1016/j.leaqua.2017.01.003

Zhang, Y., and Qu, H. (2016). The impact of CEO succession with gender change on firm performance and successor early departure: Evidence from China's publicly listed companies in 1997–2010. *Acad. Manag. J.* 59, 1845–1868. doi: 10.5465/amj.2014.0176

Zhao, J., Joas, R., Abel, J., Marques, T., and Suikkanen, J. (2013). Process safety challenges for SMEs in China. *J. Loss Prev. Process Ind.* 26, 880–886. doi: 10.1016/j.jlp.2012.09.003

Zhou, C. (2019). Effects of corporate governance on the decision to voluntarily disclose corporate social responsibility reports: evidence from China. *Appl. Econ.* 51, 5900–5910. doi: 10.1080/00036846.2019.1631440

Zhu, J., Ye, K., Tucker, J. W., and Chan, K. J. C. (2016). Board hierarchy, independent directors, and firm value: evidence from China. *J. Corp. Finance* 41, 262–279. doi: 10.1016/j.jcorpfin.2016.09.009

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Demonstrating the Psychological Aspects of Stressors and Abusive Supervision Behavior: Attainment of Sustainability Under the Rubric of Resources Theory

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This article builds on the conservation of resources (COR) theory and the challenge–hindrance stressors framework to propose a model for understanding and investigating why and when these two distinct categorized stressors similarly promote the display of abusive supervision behavior. The data from 228 supervisors and subordinates are selected by using the time-lagged method. Prior to hypothesis testing, we first conducted confirmatory factor analyses (CFAs) of the proposed models in Lisrel software. Hierarchical regression analysis revealed why and when two distinct categorized stressors positively relate to ego depletion and thus, in turn, promote the display of abusive supervision behavior. The bootstrap methods confirmed the mediating effect of ego depletion and the moderated-mediation role of emotional intelligence (EI). The findings show that both challenge and hindrance stressors are positively related to ego depletion and that ego depletion is positively associated with abusive supervision behavior. Results suggest that challenge and hindrance stressors have similar positive effects on abusive supervision behavior via the mediating effect of ego depletion. In addition, we find that supervisors' EI weakens the positive relationship between challenge stressors and ego depletion, and it also weakens the positive relationship between hindrance stressors and ego depletion. This study extends the current literature by directly testing resource depletion as a mediating mechanism and resource replenishment as a boundary condition of the effect of work stressors.

Keywords: challenge stressors, hindrance stressors, emotional intelligence, abusive supervision behavior, conservation of resources theory

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INTRODUCTION

Abusive supervision behavior has drawn much attention from several researchers in the last few decades (Mitchell et al., 2015; Camps et al., 2018; Qin et al., 2018). It refers to subordinates' perception of the extent to which supervisors engage in the sustained display of hostile verbal and non-verbal behaviors, excluding physical contact (Tepper, 2000). Empirical evidence reveals that abusive supervision behavior has a host of deleterious effects on employees (Han et al., 2017) and organizations (Mitchell and Ambrose, 2007; Frieder et al., 2015; Mackey et al., 2017). Given the hindrance role of this behavior in the sustainable development of organizations, an increasing

number of scholars have sought to probe its antecedents in order to lessen its deleterious effects. Prior empirical evidence has identified that some work stressors (e.g., exceedingly difficult job goals, task difficulty, role overload) are the antecedents of abusive supervision behavior (Burton et al., 2012; Mawritz et al., 2014; Eissa and Lester, 2017). These studies agree that work stressors often positively relate to negative behavior. More specifically, work stressors first evoke negative emotions, such as anger, anxiety, or frustration, which in turn predict abusive supervision behavior. Among the work on this stream of studies, scholars focus more on the effect of single-dimensional work stressors, that is how single-dimensional work stressors influence emotional response, thus further influencing abusive supervision behavior. Although these studies reveal that work stressors can predict abusive supervision behavior, they do not distinguish the different categories of work stressors. Hence, those findings can't well address the question of why and when distinct categorized stressors lead to abusive supervision behavior in a similar way.

Having noticed that some stressors have positive outcomes, while some others have negative outcomes, Cavanaugh et al. (2000) decided to split stressors into two distinct categories: challenge stressors and hindrance stressors, which would result in positive outcomes or negative outcomes, respectively. Workload, time urgency, job responsibility, and job complexity were considered challenge stressors, whereas red tape, role ambiguity, role conflict, and hassles were labeled as hindrance stressors (Rodell and Judge, 2009). Given how meaningful and useful these categorizations are in the workplace, stress researchers have devoted great effort to probe their outcomes, so as to effectively cope with challenge and hindrance stressors in the workplace (O'Brien and Beehr, 2019). From different perspectives, such as a psychology lens (Rodell and Judge, 2009), attitude lens (LePine et al., 2005; Wallace et al., 2009; Yao et al., 2015), and behavior lens (Rodell and Judge, 2009), previous studies investigated the possible outcomes of challenge and hindrance stressors. Following the challenge–hindrance stressors framework, these studies have found that these two distinct categorized stressors have different effects on resilience, emotional reaction, job satisfaction, job performance, cynicism, and inefficacy (LePine et al., 2005; Wallace et al., 2009; Yao et al., 2015; Crane and Searle, 2016), while having similar effects on emotional exhaustion and depression (LePine et al., 2005; Podsakoff et al., 2007; Yao et al., 2015). In a word, these studies focus more on different effects on some behaviors or attitudes and the similar effect of challenge–hindrance stressors on some psychology variables (i.e., psychology strain), ignoring that different types of stressors may have a similar effect on the same behavior through similar psychological process. Therefore, the current study pays more attention to the relationship between challenge–hindrance stressors and abusive supervision behavior, because these two categories may affect abusive supervision behavior in a similar way through similar psychological processes. Consequently, in the current study, we take the first step to explore why these two distinct categorized stressors have a similar psychological process in abusive supervision behavior. Second, we investigate when these two distinct categorized stressors would generate a similar psychological process, thus further predicting abusive supervision behavior.

Conservation of resources (COR) theory has long been an important theoretical foundation for understanding the mechanism of work stressors in behavior (Hobfoll, 1989), which declares that resource loss is ordinary in our life, and people must then invest resources in order to protect against resource loss, recover from losses, and gain resources. Under the condition of challenge stressors, individuals will invest psychological resources, such as effort, attention, and willpower, to meet the requirements of work and achieve personal growth. And under the condition of hindrance stressors, individuals will also invest psychological resources to overcome hindrance stressors, for they are detrimental to job performance goals and career growth. Such psychological resources can be also called self-regulatory resources when they are used to self-regulate or self-control (Baumeister et al., 1998). Self-regulation refers to the mental abilities possessed by individuals to control and regulate their own emotions, behaviors, and psychological states. According to COR theory, individuals have a limited self-regulatory resource reserve that can be mobilized (Shapiro et al., 1997; Hobfoll, 2002). As discussed above, dealing with challenge stressors and hindrance stressors is a typical process of self-regulation, which will consume the finite pool of self-regulatory resources. Self-regulation is the key to effectively regulating behavior because people have a finite pool of psychological resources to fuel positive behaviors and block out negative behaviors; thus, it often results in resource loss. On one hand, resource loss will result in reduced capacity for further self-regulation (Baumeister et al.,1998); on the other hand, people will also invest fewer resources to self-regulate in order to protect against further resource loss (Hobfoll, 1989). In a word, resource loss that comes from dealing with challenge stressors and hindrance stressors will cause individuals to experience self-regulation impairment, a state of self-regulatory resource depletion (Tepper et al., 2017), thereby increasing the likelihood of a supervisor's abusive behavior.

Therefore, COR provides the theoretical basis for understanding why and when challenge–hindrance stressors have a similar effect on abusive supervision behavior. The previous study has proposed that work stressors (i.e., role overload) are positively associated with abusive supervision through psychological resource depletion (Eissa and Lester, 2017). However, to date, there has been no empirical research on the mediating mechanism of specific resource depletion variables between work stressors and abusive supervision behavior. The strength model of self-control provides a specific resource depletion variable, called ego depletion, which can well represent a depletion state of self-regulatory resources (Baumeister et al., 2007). Therefore, we propose that two distinct categorized stressors may positively relate to abusive supervision behavior via ego depletion. More specifically, individuals invest their limited self-regulatory resources to cope with work stressors, which further leads to ego depletion (Baumeister et al., 1998; Baumeister et al., 2007; Hagger et al., 2010). Individuals in this state have difficulty investing resources to self-regulate and thus are more likely to exhibit abusive behavior (Barnes et al., 2015;

Lin et al., 2016). One purpose of our study is to examine the mediating role of the specific resource depletion variable between work stressors and abusive supervision behavior and to further verify the effectiveness of the explanation of the resource depletion mechanism. Resource depletion of Hierarchical CEO interferes with successor selection and innovation decision (Sarfraz et al., 2019b).

However, one should not assume that all individuals respond to the same work stressors in the same way. Previous studies suggest that task valence (a perception of task value), exercise (a leisure activity) (Burton et al., 2012), and supervisor personality (Eissa and Lester, 2017) help explain why individuals' reactions to work stressors may vary. Such previous studies have neglected the possible moderating role of variables that reflect differences in self-regulatory resources. From the perspective of COR theory, emotional intelligence (EI), which is defined as "the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought" (Salovey and Mayer, 1990), can be viewed as an individual resource characteristic variable (Koubova and Buchko, 2013) that can reflect individual differences in self-regulatory resources. This is because EI, first, as an individual's mental ability to cognize and evaluate the emotional states of oneself and others, as well as to use and express emotions (Wong and Law, 2002), is the key resource to help individuals to self-regulate in stressful situations. That is, EI is a kind of self-regulatory resource. Second, EI can help individuals gain more role resources from playing roles successfully, as well as gain more contextual resources from interpersonal interaction. Therefore, EI can well reflect individual differences in self-regulatory resources. A high level of EI can effectively replenish the depletion of an individual's self-regulatory resources; thus, it can well explain and confirm the role of the resource replenishment mechanism in coping stressors. That is, a high level of EI can help individuals weaken the depletion of self-regulatory resources under stressful conditions. Specifically, we propose that the relationship between challenge–hindrance stressors and ego depletion is weaker when supervisors have a higher level of EI. Accordingly, the present study attempts to expand the application of EI by studying its weakening effect on stressors and ego depletion, thus confirming that self-regulatory resources can help individuals deal with challenge–hindrance stressors more effectively, and the existence and effectiveness of the resource replenishment mechanism.

Our study provides several primary theoretical contributions to the literature. First, this study contributes to the enrichment of research on the relationship between challenge–hindrance stressors and abusive supervision. Furthermore, previous stress studies paid more attention to different effects on some behaviors or attitudes, and the similar effect of challenge–hindrance stressors on some psychology variables, ignoring that different categories of stressors may have a similar effect on the same behavior through a similar psychological process. Thus, we examine why and when challenge–hindrance stressors have similar effects on abusive supervision. Our findings not only can offer useful insights to understand the complex relationship between challenge–hindrance stressors and abusive supervision but also confirm that positive stressors (i.e., challenge stressors) may also result in negative leadership behavior (i.e., abusive supervision). Second, we contribute to empirical research verifying the explanatory power of the resource depletion mechanism by focusing on a specific resource depletion variable: ego depletion. Although a previous study has noted the role of resource depletion between work stressors and abusive supervision behavior (Eissa and Lester, 2017), there is no empirical research on the mediating mechanism of specific resource depletion variables. In the current study, we identify that ego depletion can serve as a specific resource depletion variable, which comes from the strength model of self-control (Baumeister et al., 2007). Furthermore, we confirm the mediating role of ego depletion, thus further revealing why challenge–hindrance stressors have a similar effect on abusive supervision behavior. Our research not only shows that resource depletion may be a key mechanism for the similar effects of challenge–hindrance stressors but also offers empirical evidence that ego depletion can be viewed as a specific resource depletion variable. Third, we enrich the existing research on EI by considering the resource replenishment mechanism as the boundary condition of the indirect relationship between work stressors and abusive supervision behavior. As stated earlier, prior studies have not focused on the possible moderating role of variables that reflect individual differences in self-regulatory resources. EI, first, itself is a kind of self-regulatory resource and, second, can help individuals gain more resources from playing roles successfully and interpersonal interaction. That is, EI can well reflect individual differences in self-regulatory resources. Thus, we recognize the necessity to examine the possible moderating role of supervisors' EI. Our findings suggest that high EI can effectively replenish the depletion of an individual's self-regulatory resources, compared to low EI. Therefore, our study expands the research on the boundary conditions of abusive supervision behavior by unveiling a new type of moderating mechanism of resource replenishment from the resource's lens. Our findings not only confirm that self-regulatory resources can help individuals deal with challenge–hindrance stressors more effectively but also confirm the existence and effectiveness of the resource replenishment mechanism. Finally, we extend the research adopting the resource lens by integrating both mediating and moderating mechanisms into a single model, providing an account of how challenge–hindrance stressors affect abusive supervision behavior in a similar way and for whom work stressors are most damaging, as well as developing practical implications by identifying ways that can be used to mitigate the effects of work stressors.

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

The Relationship Between Challenge–Hindrance Stressors and Abusive Supervision Behavior

COR theory holds that resource loss is ordinary in our lives, and then people must invest resources in order to

protect against resource loss, recover from losses, and gain resources (Hobfoll, 1989). The resource perspective can be applied to explain how supervisors respond to challenge–hindrance stressors, emphasizing the resource depletion process of dealing with the stressor. Based on the COR theory, individuals have a limited self-regulatory resource reserve that can be mobilized (Shapiro et al., 1997; Hobfoll, 2002). According to prior research, activities such as controlling unwanted behavior, managing emotions (Muraven and Baumeister, 2000), and coping with stress are required for self-regulation (Baumeister et al., 2007), and such processes often consume individuals' limited self-regulation resources (Muraven and Baumeister, 2000). Furthermore, as self-regulatory resources are continuously decreasing over time, people will become stuck in resource depletion or lose the ability to effectively regulate their behaviors (Beal et al., 2005; Wang et al., 2013). The following are two typical examples of work stressors: Challenge stressors are viewed by an individual as surmountable work-related demands that are prone to assist with achievements at work and are likely to be associated with personal potential gains and growth (Cavanaugh et al., 2000). Examples of challenge stressors include workload, time urgency, job responsibility, and job complexity (Rodell and Judge, 2009). In contrast, hindrance stressors are viewed by an individual as insurmountable work-related demands that interfere with achievements at work and are often viewed as constraints or obstacles to personal potential gains, growth, or achievements (Cavanaugh et al., 2000). Examples of hindrance stressors include red tape, role ambiguity, role conflict, and hassles (Rodell and Judge, 2009). Workplace ostracism is positively associated with stress (Sarfraz et al., 2019a).

Ego depletion refers to a depletion state of the limited pool of self-regulatory resources that individuals use to perform regulatory abilities (Baumeister et al., 1998; Baumeister et al., 2007; Hagger et al., 2010). Dealing with challenge and hindrance stressors will consume the limited pool of self-regulatory resources, leaving actors feeling resource depletion and a lack of resources to self-regulate, which is referred as a state of "ego depletion" (Baumeister et al., 1998; Baumeister et al., 2007; Hagger et al., 2010). Specifically, in order to obtain the development and growth brought by challenge stressors, individuals need to invest sustained attention, willpower, and effort to complete difficult tasks, to struggle with time urgency, to assume responsibilities, or to settle complex problems. Such activities deplete individuals' self-regulatory resources and further lead to a state of ego depletion (Baumeister et al., 2007; Loseman and van den Bos, 2012; Singh and Göritz, 2018). Similarly, when facing hindrance stressors, individuals need to invest sustained attention, willpower, and effort to cope with red tape, to solve problems of role ambiguity and role conflict, or to control the negative emotions evoked by these stressors. Such activities also deplete individuals' self-regulatory resources and further lead to a state of ego depletion (Baumeister et al., 2007; Loseman and van den Bos, 2012; Singh and Göritz, 2018). As such, based on the COR theory, it seems plausible that both challenge and hindrance stressors are positively related to ego depletion.

Hypothesis 1a: Dealing with challenge stressors is positively related to ego depletion.
Hypothesis 1b: Dealing with hindrance stressors is positively related to ego depletion.

As a typical negative leadership behavior, abusive supervision behavior is related to a broad range of deleterious effects on a host of employee and organizational outcomes (Yam et al., 2016; Mackey et al., 2017). Because of its harmfulness, supervisors often invest their limited pool of self-regulatory resources to avoid engaging in such behavior. When supervisors have abundant self-regulatory resources, they tend to perform well in self-regulatory activities. But when they face self-regulatory resource depletion, they tend to perform poorly in self-regulatory activities. In other words, when individuals have abundant self-regulatory resources, they may avoid engaging in abusive behavior through self-regulation. But when the individual's self-regulatory resources are depleted, they are more likely to engage in abusive behavior. This is because, first, they do not have enough resources to regulate and control negative behaviors (Muraven and Baumeister, 2000; Baumeister et al., 2007). Second, they will also invest fewer resources to self-regulate in order to protect against further resource loss (Hobfoll, 1989). Given that ego depletion represents a state of self-regulatory resource depletion, it seems plausible believe that supervisors more easily engage in abusive behavior when they experience more ego depletion. Specifically, when supervisors experience more ego depletion, then they may have insufficient resources or invest fewer resources to self-regulate in order to curtail abusive supervision behavior during subsequent interactions with their subordinates (Barnes et al., 2015; Lin et al., 2016; Yam et al., 2016; Welsh et al., 2018). We propose the following:

Hypothesis 2: Ego depletion is positively related to abusive supervision behavior.

From the perspective of resource depletion, challenge and hindrance stressors may similarly precipitate abusive supervision behavior via the mediating effect of ego depletion. Specifically, when facing challenge stressors, individuals invest their limited pool of self-regulation resources to acquire potential development and growth; and when facing hindrance stressors, individuals should, even more, invest their limited pool of self-regulatory resources to control their negative emotions or overcome obstructive feelings. Thus, supervisors are less likely to exercise self-control to counteract abusive tendencies because work stressors result in constant consumption of limited self-regulatory resources (Liu et al., 2015; Lam et al., 2017). As such, it seems plausible that both challenge and hindrance stressors result in ego depletion, which in turn increases the likelihood of abusive supervision behavior. Organizational justice partially mediates between an employee's perception of corporate social responsibility and employee outcomes (Sarfraz et al., 2018).

Hypothesis 3a: Challenge stressors have a positive, indirect effect on abusive supervision behavior via ego depletion of the supervisor.

Hypothesis 3b: Hindrance stressors have a positive, indirect effect on abusive supervision behavior via ego depletion of the supervisor.

Moderating Role of EI

Conservation of resources theory also can be applied to explain why individuals' reactions to workplace stressors may vary. When an individual has a larger psychological resource pool, he or she may have more self-regulatory resources to cope with stressors, thus weakening the positive effect of work stressors on ego depletion. Therefore, self-regulatory resources can be the boundary conditions of two different types of work stressors and abusive supervision behavior. Then, which variable can reflect the individual differences in self-regulatory resources?

Mayer et al. (2008) defined EI as the ability to carry out accurate reasoning emotions and use these emotions and emotional knowledge to enhance thoughts. In short, EI is a series of interpersonal and intrapersonal mental abilities that helps people to understand their own and others' emotions (Austin et al., 2007), thus further regulating their own feelings, behavior, and actions by processing their emotions. According to previous research, EI, which is an individual resource characteristic variable, can be regarded as a key psychological resource to help individuals to self-regulate in stressful situations. That is, EI itself is a kind of self-regulatory resource. To a certain extent, it can replenish the continuous depletion of an individual's self-regulatory resources when he or she performs self-regulatory activities, such as coping with work stressors. On the other hand, EI can help individuals gain more resources that they use to replenish the depletion of their self-regulatory resources. More specifically, individuals with high EI can gain more role resources by successfully playing various roles, experience more positive emotions, and gain more contextual resources from interpersonal interaction. In a word, EI can well reflect individual differences in self-regulatory resources. Therefore, individuals with high EI can effectively replenish the depletion of their self-regulatory resources. As a result, although they consume self-regulatory resources when dealing with challenge stressors and hindrance stressors, they still have sufficient resources to self-regulate, which, in turn, weakens the positive effect of work stressors on ego depletion. In contrast, individuals with low EI cannot effectively replenish the depletion of their self-regulatory resources. As a result, they have insufficient resources to self-regulate, which, in turn, strengthens the positive effect of work stressors on ego depletion.

In line with this reasoning, we propose the following:

Hypothesis 4a: EI moderates the relationship between challenge stressors and ego depletion such that the relationship is weaker for supervisors with high EI than for those with low EI.

Hypothesis 4b: EI moderates the relationship between hindrance stressors and ego depletion such that the relationship is weaker for supervisors with high EI than for those with low EI.

Finally, as we argued for the indirect effect of two different types of stressors (i.e., challenge stressors and hindrance stressors) on abusive supervision behavior through supervisors' ego depletion as well as for the moderating role of supervisors' EI, we propose a first-stage moderated-mediation model in order to illustrate the combined role of the above-discussed constructs in the display of abusive supervision behavior. That is, we expect that the weakness of this indirect effect will vary among different levels of supervisors' EI. More specifically, supervisors' EI negatively moderates the relationship between challenge stressors (or hindrance stressors) and abusive supervision behavior via ego depletion. When supervisors have high EI, the indirect effect between challenge stressors (or hindrance stressors) and abusive supervision behavior via ego depletion is weaker. When supervisors have low EI, the indirect effect between challenge stressors (or hindrance stressors) and abusive supervision behavior via ego depletion is stronger.

Hypothesis 5a: The indirect effect of challenge stressors on abusive supervision behavior via ego depletion will be weaker when supervisors have high EI rather than low EI.

Hypothesis 5b: The indirect effect of hindrance stressors on abusive supervision behavior via ego depletion will be weaker when supervisors have high EI rather than low EI.

In conclusion, the conceptual model of this study is shown in **Figure 1**.

MATERIALS AND METHODS

To obtain multi-regional and multi-industry survey data, we asked our team members to help recruit participants among their friends who play a supervisory role in their company. When their friends who had at least one subordinate responded to our request, we invited them and their direct subordinates to participate in our study. To allow matching, all participants were coded with the help of our team members, for example, a code consisting of "LD" and a serial number (i.e., LD001) for a supervisor and a code consisting of "EP" and the same serial number (i.e., EP001) for his or her direct subordinate. Questionnaires were distributed to respondents by e-mail containing a unique link code for them to the online questionnaire. To ensure data quality, participants were informed that the survey would be conducted confidentially and anonymously, and written informed consent was inferred through the completion of the survey. Participants were compensated for completing the survey.

To reduce common method bias (CMB) (Podsakoff et al., 2012) and to avoid the retrospective bias of the long interval, we conducted a multi-wave survey with a gap of 2 or 3 days according to Lin et al. (2016). At time 1 (Sunday morning), supervisors were asked to report their EI and demographic information. At time 2 (Tuesday afternoon), the challenge–hindrance stressors and ego depletion of supervisors for the past 2 days were assessed. Finally, the perception of abusive supervision behavior over the past 3 days and the

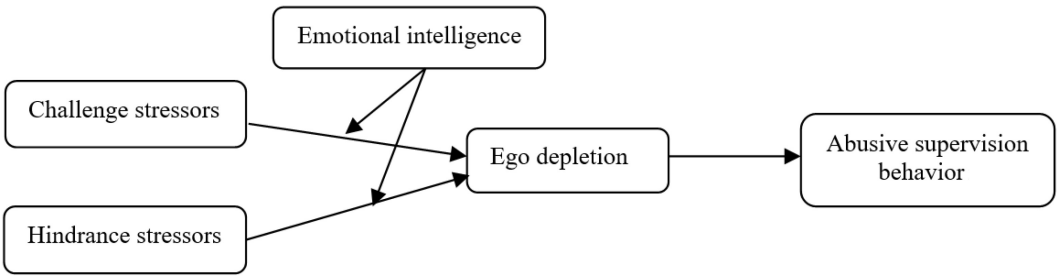

FIGURE 1 | The conceptual model.

demographic information of subordinates were assessed at time 3 (Friday afternoon).

In total, 348 supervisors agreed to participate in our study. We received 313 valid supervisors' questionnaires at T1, and the response rate was 89.94%. At T2, we distributed 313 questionnaires to those who replied effectively at T1 and received 283 valid supervisors' questionnaires; the response rate was 90.42%. At T3, we asked 1 of the 283 valid supervisors' subordinates to complete the subordinate questionnaire, and we received 228 valid subordinates' questionnaires; the response rate was 80.57%. Finally, we matched 228 dyads data from the supervisor and subordinate one by one. Of the supervisor sample, 55.26% were male, with an average age of 36.61 years (SD = 6.12) and an average education of 1.05 (0 = college degree or below, 1 = university degree, 2 = master's degree or above, SD = 0.42). Of the subordinate sample, 42.54% were male, with an average age of 30.57 years (SD = 6.33), an average education of 0.75 (SD = 0.43), and an average tenure with their supervisor of 2.50 years (SD = 1.82).

Measures

The used measures were identical to those that have been widely used in previous studies (detailed in the **Supplementary Appendix**). Most items were rated on a five-point scale.

Challenge–Hindrance Stressors

We used the 11-item measure developed by Cavanaugh et al. (2000) to test challenge stressors (items 1–6, α = 0.88) and hindrance stressors (items 7–11, α = 0.86). Participants were asked to indicate the extent to which the statements produced stress at work during the past 2 days and rated items on a scale ranging from 1 (*no stress*) to 5 (*a great deal of stress*). A sample item for challenge stressors was "The amount of time I spend at work," and a sample item for hindrance stressors was "The amount of red rape I need to go through to get my job done."

Ego Depletion

Ego depletion was measured with a five-item short scale that was used and validated by Johnson et al. (2014). These items originally came from the work of Twenge et al. (2004) and published by Christian and Ellis (2011). Participants reported the extent to which each statement represented how they felt during the past 2 days and rated items (α = 0.89) on a scale ranging from 1 *(very slightly or not at all)* to 5 (*very much)*. A sample item was "My mental energy is running low."

Emotional Intelligence

We used a 16-item version of the EI scale of Wong to measure EI (α = 0.93), including four dimensions: Self-emotion appraisal (SEA), Others' emotion appraisal (OEA), Use of emotion (UOE), Regulation of emotion (ROE) (Wong and Law, 2002). Participants reported to what extent they agreed with each statement on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree)*. A sample item was "I really understand what I feel."

Abusive Supervision Behavior

In our study, subordinates rated their direct supervisor on abusive supervision behavior during the past 3 days by using the five-item short scale (α = 0.81) of Mitchell and Ambrose (2007). Sample items included "My supervisor ridicules me" and "My supervisor tells me I'm incompetent" on a five-point scale, from 1 (*never*) to 5 (*very often*).

Control Variables

The results from prior studies suggest that supervisors' gender (0 = female, 1 = male), age, and education (0 = college degree or below, 1 = university degree, 2 = master's degree or above), as well as subordinates' tenure with the supervisor, are related to abusive supervision behavior (Breevaart and de Vries, 2017). In order to test the model rigorously, we also included supervisors' gender, age, and education, as well as subordinates' tenure with the supervisor, as control variables.

Measurement Model

Prior to hypothesis testing, we first conducted confirmatory factor analyses (CFAs) of the proposed models in Lisrel software, and the results are presented in **Table 1**. According to Little et al. (2002), when the number of construct items is relatively large while sample sizes are relatively small, parcels of items can be used to simplify the measurement model. And one technique for building parcels is to use the dimensions as the grouping criteria to create parcels. Therefore, we used four dimensions of EI as four parcels because our sample sizes were relatively small. As shown in **Table 1**, the proposed five-factor model (i.e., challenge stressors, hindrance stressors, ego depletion, EI, and abusive supervision behavior) revealed an acceptable fit (Model

TABLE 1 | Comparison of measurement models.

Model	Descriptions	χ^2	*df*	χ^2/df	$\Delta\chi^2$	CFI	IFI	RMSEA
Model 1	Five factors: CS, HS, ED, EI, AS	358.97	265.00	1.35		0.98	0.98	0.04
Model 2	Four factors: CS, HS, ED + EI, AS	714.25	269.00	2.66	355.28**	0.94	0.94	0.09
Model 3	Four factors: CS, HS, ED, EI + AS	766.16	269.00	2.85	407.19**	0.94	0.94	0.09
Model 4	Four factors: CS, HS + ED, EI, AS	836.20	269.00	3.11	477.23**	0.94	0.94	0.10
Model 5	Four factors: CS + HS, ED, EI, AS	1,096.35	269.00	4.08	737.38**	0.91	0.91	0.12
Model 6	Three factors: CS, HS + ED, EI + AS	1,233.63	272.00	4.54	874.66**	0.89	0.89	0.13
Model 7	Three factors: CS + HS, ED + EI, AS	1,455.05	272.00	5.35	1,096.08**	0.87	0.87	0.14
Model 8	Two factors: CS + HS, ED + EI + AS	1,783.80	274.00	6.51	1,424.83**	0.83	0.83	0.16
Model 9	Two factors: CS + HS + ED, EI + AS	2,163.27	274.00	7.90	1,804.30**	0.81	0.81	0.17
Model 10	One factor: CS + HS + ED + EI + AS	2,305.27	275.00	8.38	1,946.30**	0.78	0.78	0.18

*N = 228. CS = challenge stressors, HS = hindrance stressors, ED = ego depletion, EI = emotional intelligence, AS = abusive supervision behavior, RMSEA = root mean square error of approximation, CFI = comparative fit index, IFI = incremental fit index. **$p < 0.01$.*

1): [$\chi 2/df = 1.35$, comparative fit index (CFI) = 0.98, incremental fit index (IFI) = 0.98, root mean square error of approximation (RMSEA) = 0.04] and fit better than alternative models (e.g., Models 2 to 10). The test showed that the discriminant validity of our focal variables was significant.

STUDY RESULTS

Correlations and Descriptive Statistics

Table 2 presents the descriptive statistics and correlations among the study variables. The results indicated that challenge stressors ($r = 0.27$, $p < 0.01$) and hindrance stressors ($r = 0.40$, $p < 0.01$) are positively correlated with abusive supervision behavior. Challenge stressors ($r = 0.28$, $p < 0.01$) and hindrance stressors ($r = 0.48$, $p < 0.01$) are positively correlated with ego depletion, and ego depletion is positively correlated with abusive supervision behavior ($r = 0.44$, $p < 0.01$).

Hypothesis Testing

Hierarchical regression analysis was adopted to test Hypotheses 1–4 (including a and b). First, as presented in **Table 3**, Hypothesis 1a, which predicates a positive relationship between challenge stressors and ego depletion, is supported (β = 0.15, $p < 0.05$, M1), and Hypothesis 1b, which predicates a positive relationship between hindrance stressors and ego depletion, is also supported (β = 0.39, $p < 0.001$, M1). Second, Hypothesis 2, which predicates a positive relationship between ego depletion and abusive supervision behavior, is supported (β = 0.31, $p < 0.001$, M6). Third, as illustrated in **Table 3**, challenge stressors are significantly and positively correlated with ego depletion (β = 0.15, $p < 0.05$, M1), and hindrance stressors are also significantly and positively correlated with ego depletion (β = 0.39, $p < 0.001$, M1). In addition, ego depletion is significantly and positively correlated with abusive supervision behavior (β = 0.31, $p < 0.001$, M6). When ego depletion as the mediator variable is added into the model, ego depletion is significantly and positively correlated with abusive supervision behavior (β = 0.21, $p < 0.001$, M7). But the effects of challenge stressors on abusive supervision behavior (β = 0.09, $p < 0.05$, M7) and the effects of hindrance stressors on abusive supervision behavior (β = 0.14, $p < 0.01$, M7) are weakened.

To further verify this mediating effect, we used Model 4 of the PROCESS macro with 5,000 resamples to test the indirect effect of challenge stressors and hindrance stressors on abusive supervision behavior via ego depletion. Results suggested that the indirect effect of challenge stressors on abusive supervision behavior through ego depletion ($b = 0.03$, boot SE = 0.02, 95% CI = [0.01, 0.07], excludes zero) is significant, and the indirect effect of hindrance stressors on abusive supervision behavior through ego depletion ($b = 0.08$, boot SE = 0.03, 95% CI = [0.03, 0.14], excludes zero) is also significant. These findings together provided statistical evidence for a mediating effect of ego depletion. Overall, Hypotheses 3a and 3b are supported.

Hypotheses 4a and 4b posited that EI would moderate the relationship between two different types of stressors (i.e., challenge stressors and hindrance stressors) and ego depletion, such that the relationship would be weaker (stronger) for supervisors high (low) in EI. **Table 3** shows the results of the moderate role of EI. As shown in M3, the interaction of challenge stressors and EI is negatively and significantly related to ego depletion (β = −0.25, $p < 0.05$, M3). In order to clearly interpret the moderating effects, interaction effects are plotted. As shown in **Figure 2**, the positive relationship between challenge stressors and ego depletion is much more distinct in low EI (−1SD) rather than in high EI (+1SD). And results also suggest that the interaction of hindrance stressors and EI is negatively and significantly related to ego depletion (β = −0.26, $p < 0.01$, M4). In order to clearly interpret the moderating effects, interaction effects are plotted. As shown in **Figure 3**, the positive relationship between hindrance stressors and ego depletion is much more distinct in low EI (−1SD) than in high EI (+1SD). Therefore, Hypotheses 4a and 4b are supported.

Finally, we used Model 7 of the PROCESS macro with 5,000 resamples to generate bootstrap confidence intervals for the conditional indirect effect of two distinct categorized stressors (i.e., challenge stressors and hindrance stressors) on abusive supervision behavior via ego depletion at different levels of supervisors' EI (see **Table 4**). For supervisors who had a high level of EI (+1SD), challenge stressors did not have a significant

TABLE 2 | Descriptive statistics and correlations.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
CS	3.65	0.76	(0.88)							
HS	3.00	0.84	0.30**	(0.86)						
ED	3.05	0.76	0.28**	0.48**	(0.89)					
EI	3.68	0.51	−0.15*	−0.31**	−0.35**	(0.93)				
AS	2.61	0.54	0.27**	0.40**	0.44**	−0.33**	(0.81)			
Gender[a]	0.55	0.50	−0.03	−0.08	−0.06	0.09	−0.12			
Age	36.61	6.12	−0.04	−0.05	−0.05	0.03	−0.01	0.21**		
Education[b]	1.05	0.42	−0.05	−0.01	0.01	0.19**	−0.05	0.05	−0.15*	
Tenure[c]	2.50	1.82	−0.03	0.02	−0.01	0.12	0.02	0.06	0.23**	0.02

*N = 228. Coefficient alphas are given in parentheses on the diagonal. Tenure = subordinate's tenure with the supervisor. [a]0 = female, 1 = male. [b]0 = college degree or below, 1 = university degree, 2 = master's degree or above. [c]This was completed only by subordinates and is in yearly units. *p < 0.05, **p < 0.01.*

TABLE 3 | Results of hierarchical regression analyses.

Variables	ED				AS					
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
	B	B	B	B	B	B	B	B	B	B
Predictors										
CS	0.15*	0.14*	0.18**	0.14*	0.12**		0.09*	0.09*	0.06	0.08
HS	0.39***	0.33***	0.31***	0.35***	0.22***		0.14**	0.12**	0.13**	0.10*
ED						0.31***	0.21***	0.18***	0.20***	0.21***
EI		−0.35***	−0.38***	−0.32***				−0.17*	−0.13	−0.18**
CS × EI			−0.25*						0.18*	
HS × EI				−0.26**						0.16*
Constant	1.37***	2.75***	2.78***	2.43***	1.50***	1.70***	1.21***	1.92***	1.85***	2.06***
Controls										
Gender	−0.03	−0.01	−0.02	−0.02	−0.10	−0.10	−0.09	−0.08	−0.08	−0.08
Age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.002
Education	0.03	0.11	0.13	0.15	−0.03	−0.05	−0.04	0.00	−0.02	−0.03
Tenure	−0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
F	12.19***	13.10***	12.43***	12.80***	8.88***	11.31***	11.10***	10.70***	10.32***	10.33***
R^2	0.25	0.30	0.31	0.32	0.19	0.20	0.26	0.28	0.30	0.30
ΔR^2	0.24***	0.05***	0.02*	0.03**	0.18***	0.19***	0.07***	0.02*	0.02*	0.02*

*N = 228. Unstandardized regression coefficients are reported. Tenure = subordinate's tenure with the supervisor. *p < 0.05, **p < 0.01, ***p < 0.001.*

indirect effect on abusive supervision behavior through ego depletion (b = 0.010, boot SE = 0.014, 95%CI = [−0.017, 0.040], contains zero). For supervisors who had a low level of EI (−1SD), challenge stressors had a significant indirect effect on abusive supervision behavior through ego depletion (b = 0.065, boot SE = 0.036, 95%CI = [0.014, 0.154], excludes zero). And the pairwise contrasts between these conditional indirect effects were significant (b = −0.054, boot SE = 0.038, 95%CI = [−0.147, −0.001], excludes zero). Consequently, Hypothesis 5a is supported. Similarly, for supervisors who had a high level of EI (+1SD), hindrance stressors had a significant indirect effect on abusive supervision behavior through ego depletion (b = 0.046, boot SE = 0.020, 95%CI = [0.013, 0.092], excludes zero). For supervisors who had a low level of EI (−1SD), hindrance stressors also had a significant indirect effect on abusive supervision behavior through ego depletion (b = 0.101, boot SE = 0.034, 95%CI = [0.041, 0.174], excludes zero). And the pairwise contrasts between these conditional indirect effects were significant (b = −0.055, boot SE = 0.026, 95%CI = [−0.112, −0.012], excludes zero). Consequently, Hypothesis 5b is also supported.

STUDY DISCUSSION

In our study, we developed and tested a model based on COR theory that attempted to probe why and when challenge and hindrance stressors have similar effects on abusive supervision behavior. As predicted, our findings first suggest that both challenge stressors and hindrance stressors have a positive effect on ego depletion, and ego depletion has a positive effect on abusive supervision behavior. Moreover, the findings also reveal that work stressors provoke ego depletion, which in turn triggers abusive supervision behavior. In this vein, the similar effects of

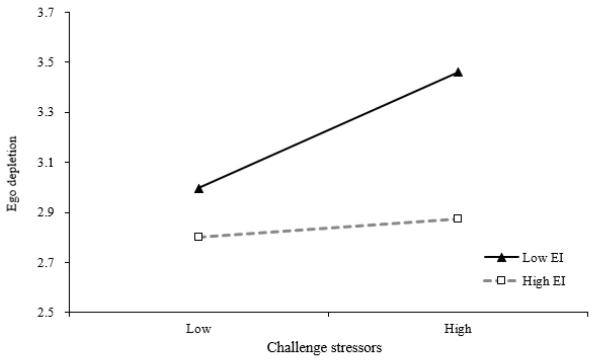

FIGURE 2 | Interactive effects of challenge stressors and emotional intelligence (EI) on ego depletion.

FIGURE 3 | Interactive effects of hindrance stressors and EI on ego depletion.

challenge–hindrance stressors on abusive supervision behavior are instigated through ego depletion. Because ego depletion can well represent a state of self-regulatory resource depletion (Baumeister et al., 2007), as a result, our study reveal that self-regulatory resource depletion may be a key mediating mechanism that explains why two distinct categorized stressors have similar effects on abusive behavior (Barnes et al., 2015; Yam et al., 2016; Welsh et al., 2018). In addition, on the basis of COR, the present study also examined whether supervisors' EI moderated the relationship between work stressors and ego depletion. Specifically, we found that the effect of challenge and hindrance stressors on abusive supervision behavior was weakened when the supervisor had a high level of EI. Finally, supervisors' EI played a first-stage moderated-mediation role in the indirect effects of challenge stressors on abusive supervision and hindrance stressors on abusive supervision. That is, when the level of EI was high, the indirect effect of challenge stressors on abusive supervision behavior through ego depletion was weaker, and the indirect effect of hindrance stressors on abusive supervision behavior through ego depletion was also weaker. When the level of EI was low, the indirect effect of challenge stressors on abusive supervision behavior through ego depletion was stronger, and the indirect effect of hindrance stressors on abusive supervision behavior through ego depletion was also stronger. Because EI can well reflect individual differences in self-regulatory resources, as a result, our study reveal that resource replenishment may be a key mediating mechanism that explains when challenge–hindrance stressors have similar effects on abusive behavior.

TABLE 4 | Indirect effect estimates with 95% confidence intervals.

Predictors	Estimate	Boot SE	LLCI	ULCI
CS → ED → AS				
Low EI (Effect1)	0.065	0.036	0.014	0.154
High EI (Effect2)	0.010	0.014	−0.017	0.040
Pairwise contrasts (Effect1–Effect2)	−0.054	0.038	−0.147	−0.001
HS → ED → AS				
Low EI (Effect1)	0.101	0.034	0.041	0.174
High EI (Effect2)	0.046	0.020	0.013	0.092
Pairwise contrasts (Effect1–Effect2)	−0.055	0.026	−0.112	−0.012

N = 228. LLCL = lower limit of confidence interval; ULCL = upper limit of confidence interval.

CONCLUSION

Drawing on COR theory, the current study developed and tested a model that explicates why and when challenge stressors and hindrance stressors lead to abusive supervision behavior. First, we found that both challenge stressors and hindrance stressors have a positive relationship to ego depletion, and ego depletion has a positive relationship to abusive supervision behavior. Second, we argued that resource depletion is the underlying mechanism of work stressors and abusive supervision behavior and testified to the mediating role of resource depletion between work stressors and abusive supervision behavior through a specific variable of psychological resource depletion: ego depletion. Finally, our findings suggested that EI, which is a characteristic variable and reflects individual differences in self-regulatory resources, is a moderating mechanism between challenge–hindrance stressors and ego depletion and has a first-stage moderated-mediation role in the indirect effects of these two distinct categorized stressors on abusive supervision. This study extends the current literature by directly testing self-regulatory resource depletion as a mediating mechanism and resource replenishment as a boundary condition of the effect of work stressors.

Theoretical Implications

The current study provides several contributions to the existing literature. First, this study contributes to the enrichment of the relationship between challenge–hindrance stressors and abusive supervision. Although previous studies have found that work stressors are positively related to abusive supervision behavior (Burton et al., 2012; Mawritz et al., 2014; Eissa and Lester, 2017), knowledge about the similar effect of challenge–hindrance stressors on abusive supervision is limited. Furthermore, following the challenge–hindrance stressors framework, previous stress studies focused more on the different effects on some behaviors or attitudes and the similar effect on some psychology variables, ignoring that different categories of stressors may have a similar effect on the same behavior through similar

psychological process. Although challenge stressors may result in some positive outcomes (i.e., enthusiasm, Wood and Michaelides, 2016; job performance, Wallace et al., 2009), this category is the same as hindrance stressors and will also consume individuals' psychological resources when coped with. So, we reason that these two distinct categorized stressors may have a similar effect on abusive supervision behavior under the mechanism of self-regulatory resource depletion. Therefore, both challenge and hindrance stressors will consume the limited self-regulatory resources, resulting in the decline of self-regulation and in turn promoting the display of abusive supervision behavior. The current study expands the research on the similar effect of challenge–hindrance stressors on abusive supervision behavior and explains the intrinsic mechanism of the similar effect. Additionally, our findings also offer empirical evidentiary support for the self-regulation impairment explanation for abusive supervision (Tepper et al., 2017) and confirm that positive stressors (i.e., challenge stressors) may also result in negative leadership behavior (i.e., abusive supervision).

Second, we contribute to empirical research verifying the explanatory power of the resource depletion mechanism by focusing on a specific resource depletion variable: ego depletion. While previous studies have described the relationship between work stressors and abusive supervision behavior through negative emotions (Burton et al., 2012; Mawritz et al., 2014; Eissa and Lester, 2017), given that challenge stressors have been shown to evoke positive affect and negative affect (i.e., attentiveness and anxiety), while hindrance stressors have been shown to evoke negative affect (i.e., anger) (Rodell and Judge, 2009), the similar effect of two distinct categorized stressors on abusive supervision behavior cannot be discussed from the lens of emotional reaction. Our study predicts the relationship between challenge and hindrance stressors and abusive supervision behavior and supports the argument that the similar effects of work stressors are more likely to occur under resource depletion rather than emotional reaction. In our study, we found that ego depletion, a specific resource depletion variable, served as an important mediator linking work stressors to abusive supervision behavior. This suggests that both challenge stressors and hindrance stressors could drain supervisors' self-regulatory resources at work and make them more likely to engage in abusive supervision behavior. Thus, our results show that resource depletion may be a key mechanism that explains why two distinct categorized stressors have similar effects on abusive behavior (Barnes et al., 2015; Yam et al., 2016; Welsh et al., 2018). Furthermore, our findings can offer empirical evidence that ego depletion can be viewed as a specific resource depletion variable.

Third, we enrich the existing research on EI by considering the resource replenishment mechanism as the boundary condition of the indirect relationship between work stressors and abusive supervision behavior. Although previous findings suggest that work stressors induce abusive supervision behavior, our findings show that this is not always the case from the lens of the resource. EI, first, itself is a kind of self-regulatory resource and, second, can help individuals gain more resources from playing roles successfully and interpersonal interaction. That is, EI can well reflect individual differences in self-regulatory resources. Therefore, EI enables individuals to effectively replenish the depletion of their self-regulatory resources. By examining the moderating effects of EI on the relationship between work stressors and ego depletion, our research reveals that EI plays a first-stage moderated-mediation role in the indirect effects of challenge stressors on abusive supervision and hindrance stressors on abusive supervision. Highlighting the role of EI, therefore, enriches the existing research by considering resource replenishment as the boundary condition of the indirect relationship between work stressors and abusive supervision behavior. Thus, our results show that resource replenishment may be a key mechanism that explains when challenge–hindrance stressors have similar effects on abusive behavior. Furthermore, our findings not only confirm the resource replenishment role of EI in stressful conditions but also confirm the existence and effectiveness of the resource replenishment mechanism. The logic of replenishment mechanisms can be used in stressful conditions to manage stress more effectively.

Finally, the present study applies the perspective of COR theory to understanding challenge–hindrance stressors and its negative consequences (i.e., ego depletion and abusive supervision behavior). This perspective provides a theoretical nuance that is particularly suitable for understanding the state of self-regulatory resource depletion as a reaction to work stressor change and for accounting for subsequent aggressive behaviors (Barnes et al., 2015; Lin et al., 2016). In addition, this perspective also provides evidence for the condition that individual differences in self-regulatory resources will affect the indirect effect of challenge–hindrance stressors on abusive supervision behavior. Accordingly, our study is theoretically driven by COR theory, thus helping people to gain a greater understanding of the complex relationship between two distinct categorized stressors and abusive supervision behavior and to comprehensively understand why and when distinct categorized stressors have a similar effect on abusive supervision behavior.

Practical Implications

Our research also provides some guidance for managerial practice. First, our research identifies challenge and hindrance stressors as possible reasons for provoking abusive supervision behavior. In this vein, organizational decision-makers are well advised to be cautious about stressors in the work environment. It is widely believed that challenge stressors are often positively correlated with work performance. However, our study shows that challenge stressors can also lead to negative behavior. Therefore, organizational decision-makers should set appropriate indicators (i.e., a suitable workload or an attainable goal) for supervisors to reduce the negative impact of challenge stressors. In contrast, organizational decision-makers should minimize hindrance stressors. They should cut through red tape to improve efficiency and help supervisors maintain or protect their psychological resources. They should also provide clear role descriptions and effective communication about work roles to help supervisors reduce role conflict and role ambiguity.

Second, from the lens of resource depletion, the present study sheds light upon the mediating mechanism of ego depletion. This finding suggests that ego depletion transmits

the detrimental effects of challenge and hindrance stressors. Thus, organizational decision-makers should pay more attention to creating opportunities for replenishment and recuperation of self-regulatory resources. The current study indicates that the direct way of conserving and replenishing self-regulatory resources is to reduce stressors in the work environment or to create appropriate channels for releasing stress. And other ways might include supporting more resources (e.g., more organizational support) for replenishment, providing enough time for recuperation, and so on.

Finally, our findings also showed that supervisors' EI moderated the positive relationship between challenge and hindrance stressors and resource depletion, such that this relationship was strengthened only when supervisors' EI was low (vs. high). And supervisors' EI also moderated the indirect effect of challenge and hindrance stressors and abusive supervision behavior. As we discussed above, individuals with high EI can effectively replenish the continuous depletion of their self-regulatory resources when they cope with work stressors. Therefore, another means for lessening abusive supervision behavior is developing more self-regulatory resources through EI training. Organizational decision-makers might regularly provide EI training programs to help individuals gain more self-regulatory resources. Ways of training supervisors' EI might include actually helping them to cognize their self-emotion and others' emotion and to know how to use and regulate emotion.

Limitations and Future Directions

Our study also has several limitations that provide directions for future research. First, we focused on the similar effect of challenge–hindrance stressors on abusive supervision behavior via resource depletion. However, according to the Affective Events Theory (AET) (Weiss and Cropanzano, 1996), challenge stressors can be viewed as positive work events, which in turn evoke more positive affect, while hindrance stressors can be viewed as negative work events, which in turn evoke more negative affect. Therefore, these two distinct categorized stressors may have different effects on abusive supervision behavior via different affect reactions. Future research should focus on why and when challenge–hindrance stressors have different effects on abusive supervision behavior.

Second, we designed a time-lagged study to probe the relationship between two different types of stressors and abusive supervision behavior. However, it is possible that other factors may influence supervisors' stressors, ego depletion, and abusive supervision behavior, which we cannot control in our design. Future research using an experimental design may control many other factors in organizational situations, thus examining more definitive causal inferences between the variables in our model.

Finally, consistent with the research of Lin et al. (2016), we measured all variables at three time points in a week to avoid the retrospective bias of the long interval. The first limitation is that both independent variables and mediating variables came from the same source (self-report by supervisor) at the same time point and thus may have CMB (Podsakoff et al., 2012). In addition, although abusive supervision behavior in our study was reported by subordinates, results might deviate if such behavior were reported by the supervisor or by peers. Future research can measure abusive supervision behavior from three sources—supervisor, subordinate, and peers—and discuss the difference among them.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

All study procedures were approved by the Ethics Committee of the Guangdong University of Technology, and informed consent of the participation was implied through survey completion.

AUTHOR CONTRIBUTIONS

ZL and BH conceived and designed the study. ZL collected and analyzed the data. ZL and XS interpreted the data and drafted the manuscript. BH, ZL, XS, and YZ reviewed and edited the manuscript. XS administered the project.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00293/full#supplementary-material

REFERENCES

Austin, E. J., Farrelly, D., Black, C., and Moore, H. (2007). Emotional intelligence, Machiavellianism and emotional manipulation: does EI have a dark side? *Personal. Individ. Differ.* 43, 179–189. doi: 10.1016/j.paid.2006.11.019

Barnes, C. M., Lucianetti, L., Bhave, D. P., and Christian, M. S. (2015). You wouldn't like me when I'm sleepy": leaders' sleep, daily abusive supervision, and

work unit engagement. *Acad. Manage. J.* 58, 1419–1437. doi: 10.5465/amj.2013.1063

Baumeister, R. F., Bratslavsky, E., Muraven, M., and Tice, T. D. (1998). Ego depletion: is the active self a limited resource? *J. Personal. Soc. Psychol.* 74, 1252–1265. doi: 10.1037/0022-3514.74.5.1252

Baumeister, R. F., Vohs, K. D., and Tice, D. M. (2007). The strength model of self-control. *Curr. Direct. Psychol. Sci.* 43, 179–189. doi: 10.1111/j.1467-8721.2007.00534.x

Beal, D. J., Weiss, H. M., Barros, E., and MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *J. Appl. Psychol.* 90, 1054–1058. doi: 10.1037/0021-9010.90.6.1054

Breevaart, K., and de Vries, R. E. (2017). Supervisor's HEXACO personality traits and subordinate perceptions of abusive supervision. *Leadersh. Quart.* 28, 691–700. doi: 10.1016/j.leaqua.2017.02.001

Burton, J. P., Hoobler, J. M., and Scheuer, M. L. (2012). Supervisor workplace stress and abusive supervision: the buffering effect of exercise. *J. Bus. Psychol.* 27, 271–279. doi: 10.1007/s10869-011-9255-0

Camps, J., Stouten, J., Euwema, M., and De Cremer, D. (2018). Abusive supervision as a response to follower hostility: a moderated mediation model. *J. Bus. Ethics* doi: 10.1007/s10551-018-4058-0

Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., and Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *J. Appl. Psychol.* 85, 65–74. doi: 10.1037/0021-9010.85.1.65

Christian, M. S., and Ellis, A. P. J. (2011). Examining the effects of sleep deprivation on workplace deviance: a self-regulatory perspective. *Acad. Manage. J.* 54, 913–934. doi: 10.5465/amj.2010.0179

Crane, M. F., and Searle, B. J. (2016). Building resilience through exposure to stressors: the effects of challenges versus hindrances. *J. Occupat. Health Psychol.* 21, 468–479. doi: 10.1037/a0040064

Eissa, G., and Lester, S. W. (2017). Supervisor role overload and frustration as antecedents of abusive supervision: the moderating role of supervisor personality. *J. Organ. Behav.* 21, 468–479. doi: 10.1002/job.2123

Frieder, R. E., Hochwarter, W. A., and DeOrtentiis, P. S. (2015). Attenuating the negative effects of abusive supervision: the role of proactive voice behavior and resource management ability. *Leadersh. Quart.* 26, 821–837. doi: 10.1016/j.leaqua.2015.06.001

Hagger, M. S., Wood, C., Stiff, C., and Chatzisarantis, N. L. D. (2010). Ego depletion and the strength model of self-control: a meta-analysis. *Psychol. Bull.* 136, 495–525. doi: 10.1037/a0019486

Han, G. H., Harms, P. D., and Bai, Y. (2017). Nightmare bosses: the impact of abusive supervision on employees' sleep, emotions, and creativity. *J. Bus. Ethics* 145, 21–31. doi: 10.1007/s10551-015-2859-y

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44:513. doi: 10.1037/0003-066x.44.3.513

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gen. Psychol.* 6:307. doi: 10.1037/1089-2680.6.4.307

Johnson, R. E., Lanaj, K., and Barnes, C. M. (2014). The good and bad of being fair: effects of procedural and interpersonal justice behaviors on regulatory resources. *J. Appl. Psychol.* 99, 635–650. doi: 10.1037/a0035647

Koubova, V., and Buchko, A. A. (2013). Life-work balance: emotional intelligence as a crucial component of achieving both personal life and work performance. *Manage. Res. Rev.* 36, 700–719. doi: 10.1108/mrr-05-2012-0115

Lam, C. K., Walter, F., and Huang, X. (2017). Supervisors' emotional exhaustion and abusive supervision: the moderating roles of perceived subordinate performance and supervisor self-monitoring. *J. Organ. Behav.* 38, 1151–1166. doi: 10.1002/job.2193

LePine, J. A., Podsakoff, N. P., and LePine, M. A. (2005). A meta-analytic test of the challenge Stressor-hindrance stressor framework: an explanation for inconsistent relationships among Stressors and performance. *Acad. Manage. J.* 48, 764–775. doi: 10.5465/AMJ.2005.18803921

Lin, S. H., Ma, J., and Johnson, R. E. (2016). When ethical leader behavior breaks bad: how ethical leader behavior can turn abusive via ego depletion and moral licensing. *J. Appl. Psychol.* 48, 764–775. doi: 10.1037/apl0000098

Little, T. D., Cunningham, W. A., Shahar, G., and Widaman, K. F. (2002). To parcel or not to parcel: exploring the question, weighing the merits. *Struct. Equat. Model.* 9, 151–173. doi: 10.1207/s15328007sem0902_1

Liu, Y., Wang, M., Chang, C.-H., Shi, J., Zhou, L., and Shao, R. (2015). Work–family conflict, emotional exhaustion, and displaced aggression toward others: the moderating roles of workplace interpersonal conflict and perceived managerial family support. *J. Appl. Psychol.* 100:793. doi: 10.1037/a0038387

Loseman, A., and van den Bos, K. (2012). A self-regulation hypothesis of coping with an unjust world: ego-depletion and self-affirmation as underlying aspects of blaming of innocent victims. *Soc. Justice Res.* 25, 1–13. doi: 10.1007/s11211-012-0152-0

Mackey, J. D., Frieder, R. E., Brees, J. R., and Martinko, M. J. (2017). Abusive supervision: a meta-analysis and empirical review. *J. Manage.* 43, 1940–1965. doi: 10.1177/0149206315573997

Mawritz, M. B., Folger, R., and Latham, G. P. (2014). Supervisors' exceedingly difficult goals and abusive supervision: the mediating effects of hindrance stress, anger, and anxiety. *J. Organ. Behav.* 35, 358–372. doi: 10.1002/job.1879

Mayer, J. D., Salovey, P., and Caruso, D. R. (2008). Emotional intelligence: new ability or eclectic traits? *Am. Psychol.* 63, 503–517. doi: 10.1037/0003-066X.63.6.503

Mitchell, M. S., and Ambrose, M. L. (2007). Abusive supervision and workplace deviance and the moderating effects of negative reciprocity beliefs. *J. Appl. Psychol.* 92, 1159–1168. doi: 10.1037/0021-9010.92.4.1159

Mitchell, M. S., Vogel, R. M., and Folger, R. (2015). Third parties' reactions to the abusive supervision of coworkers. *J. Appl. Psychol.* 100:1040. doi: 10.1037/apl0000002

Muraven, M., and Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: does self-control resemble a muscle? *Psychol. Bull.* 126, 247–259. doi: 10.1037/0033-2909.126.2.247

O'Brien, K. E., and Beehr, T. A. (2019). So far, so good: UP to now, the challenge–hindrance framework describes a practical and accurate distinction. *J. Organ. Behav.* 40, 962–972. doi: 10.1002/job.2405

Podsakoff, N. P., LePine, J. A., and LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: a meta-analysis. *J. Appl. Psychol.* 92:438. doi: 10.1037/0021-9010.92.2.438

Podsakoff, P. M., MacKenzie, S. B., and Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annu. Rev. Psychol.* 63, 539–569. doi: 10.1146/annurev-psych-120710-100452

Qin, X., Huang, M., Johnson, R. E., Hu, Q., and Ju, D. (2018). The short-lived benefits of abusive supervisory behavior for actors: an investigation of recovery and work engagement. *Acad. Manage. J.* 61, 1951–1975. doi: 10.5465/amj.2016.1325

Rodell, J. B., and Judge, T. A. (2009). Can "Good" stressors spark "Bad" behaviors? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviors. *J. Appl. Psychol.* 94, 1438–1451. doi: 10.1037/a0016752

Salovey, P., and Mayer, J. D. (1990). Emotional intelligence. *Imaginat. Cognit. Personal.* 9, 185–211.

Sarfraz, M., Qun, W., Abdullah, M. I., and Alvi, A. T. (2018). Employees' perception of corporate social responsibility impact on employee outcomes: mediating role of organizational justice for small and medium enterprises (SMEs). *Sustainability (Switzerland)* 10:2429. doi: 10.3390/su10072429

Sarfraz, M., Qun, W., Sarwar, A., Abdullah, M. I., Imran, M. K., and Shafique, I. (2019a). Mitigating effect of perceived organizational support on stress in the presence of workplace ostracism in the Pakistani nursing sector. *Psychol. Res. Behav. Manage.* 12, 839–849. doi: 10.2147/PRBM.S210794

Sarfraz, M., Qun, W., Shah, S. G. M., and Fareed, Z. (2019b). Do hierarchical Jumps in CEO succession invigorate innovation? Evidence from chinese economy. *Sustainability* 11:2017. doi: 10.3390/su11072017

Shapiro, K. L., Caldwell, J., and Sorensen, R. E. (1997). Personal names and the attentional blink: a visual "cocktail party" effect. *J. Exp. Psychol. Hum. Percept. Perform.* 23, 504–514. doi: 10.1037/0096-1523.23.2.504

Singh, R. K., and Göritz, A. S. (2018). Ego depletion does not interfere with working memory performance. *Front. Psychol.* 9:538. doi: 10.3389/fpsyg.2018.00538

Tepper, B. J. (2000). Consequences of abusive supervision. *Acad. Manage. J.* 43, 178–190. doi: 10.2307/1556375

Tepper, B. J., Simon, L., and Park, H. M. (2017). Abusive supervision. *Annu. Rev. Organ. Psychol. Organ. Behav.* 4, 123–152.

Twenge, J. M., Muraven, M., and Tice, D. M. (2004). *Measuring State Self-Control: Reliability, Validity, and Correlations with Physical and Psychological Stress*. San Diego, CA. *Unpublished Manuscript*.

Wallace, J. C., Edwards, B. D., Arnold, T., Frazier, M. L., and Finch, D. M. (2009). Work stressors, role-based performance, and the moderating influence of organizational support. *J. Appl. Psychol.* 94, 254–262. doi: 10.1037/a0013090

Wang, M., Liu, S., Liao, H., Gong, Y., Kammeyer-Mueller, J., and Shi, J. (2013). Can't get it out of my mind: employee rumination after customer mistreatment and negative mood in the next morning. *J. Appl. Psychol.* 98, 989–1004. doi: 10.1037/a0033656

Weiss, H. M., and Cropanzano, R. (1996). Affective events theory: a theoretical discussion of the structure, causes and consequences of affective experiences at work. *Res. Organ. Behav.* 18, 1–74.

Welsh, D. T., Mai, K. M., Ellis, A. P. J., and Christian, M. S. (2018). Overcoming the effects of sleep deprivation on unethical behavior: an extension of integrated self-control theory. *J. Exp. Soc. Psychol.* 76, 142–154. doi: 10.1016/j.jesp.2018.01.007

Wong, C. S., and Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: an exploratory study. *Leadersh. Quart.* 13, 243–274. doi: 10.1016/S1048-9843(02)00099-1

Wood, S. J., and Michaelides, G. (2016). Challenge and hindrance stressors and wellbeing-based work-nonwork interference: a diary study of portfolio workers. *Hum. Relat.* 69, 111–138. doi: 10.1177/0018726715580866

Yam, K. C., Fehr, R., Keng-Highberger, F. T., Klotz, A. C., and Reynolds, S. J. (2016). Out of control: a self-control perspective on the link between surface acting and abusive supervision. *J. Appl. Psychol.* 101, 292–301. doi: 10.1037/apl0000043

Yao, A. Y., Jamal, M., and Demerouti, E. (2015). Relationship of challenge and hindrance stressors with burnout and its three dimensions. *J. Pers. Psychol.* 14, 203–212. doi: 10.1027/1866-5888/a000141

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"Do Good, Have Good": A Serial Mediation Analysis of CSR with Customers' Outcomes

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Corporate social responsibility (CSR) is envisaged to offer several outcomes and while customer-specific consequences are unclear or have not obtained due attention, there is a dearth of literature that focuses on perceptual, attitudinal and behavioral outcomes in tandem. Against this backdrop, this study entails the investigation of perceptual (service quality), attitudinal (affective commitment) and behavioral (customer citizenship behavior) outcomes of CSR through a serial mediation mechanism. A total of 994 responses obtained from fast-food restaurants, highlight the fact that CSR influences service quality, affective commitment, and customer citizenship behavior. Moreover, it is witnessed that CSR influences customer citizenship behavior indirectly as well, as the serial mediation mechanism is also proved. The practical and theoretical usefulness of the study is also provided at the end.

Keywords: affective commitment, corporate social responsibility, customer citizenship behavior, developing country, fast food restaurants, service quality

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INTRODUCTION

Recently a business roundtable covering the CEOs of the top 200 firms concluded that maximization of profits and shareholders' wealth is no more the basic purpose of a business; rather businesses aim at creating value for suppliers, employees, customers, community and the environment at large (Forbes, 2019; Shah et al., 2019). This paradigm shift pays a lot, since socially responsible businesses have been found outperforming their counterparts (Sarfraz et al., 2018; D'Amato and Falivena, 2019), as CSR investments offer a competitive advantage over rivals (Latif and Sajjad, 2018). The shift is in concordance with the current challenges of global warming and increasing economic disparity (Blowfield and Murray, 2014; Carroll, 2016).

The changing landscape of the business practices and its possible outcomes has beckoned researchers and practitioners to carry out studies focusing on the value of such investments for the business (Sarfraz et al., 2019). Past studies have noticed that CSR can offer various positive outcomes at different levels. For instance, CSR investments pay off in shape of positive attitudinal changes in employees (e.g., job satisfaction, commitment, engagement; Asrar-ul-Haq et al., 2017;

Story and Castanheira, 2019), innovativeness and competitiveness (Marin et al., 2017), and better market value (D'Amato and Falivena, 2019). Yet another aspect that has largely gained less attention is customer based outcomes of CSR investments (Marin et al., 2009) and while the empirical literature from developing countries is even scarce (Huang et al., 2019), Pakistan is not an exception to it (Gilal et al., 2019).

Against this backdrop, this study entails the investigation of CSR outcomes in shape of customer citizenship behavior (CCB), which is defined as extra-role (voluntary) customers' behavior and focuses on helping other customers and providing suggestions to improve products and services (Bartikowski and Walsh, 2011; Tung et al., 2017). When the level of CCB is high in organisations, these organisations are found to be more efficient (Mills et al., 1983) with a better competitive position (Yi et al., 2011). While looking at the link between CSR and CCB, literature shows that there is a dearth of studies focusing on this possible association. Moreover, this study also encompasses the investigation of the mechanism between CSR and CCB through serial mediation of service quality perceptions (perceptual factor) and affective commitment (attitudinal factor) of customers. This mechanism has also not gained much attention in past studies of CSR.

We drew our CSR and CCB mechanism with the help of the attachment theory (AT) (Bowlby, 1969), attribution theory (Heider, 1958), and affect infusion model (Forgas, 1995). For instance, AT highlights that customers, due to some organizational positive factors (here CSR), gets attached with a firm or its products/services and resultantly reciprocates through positive behavior (e.g., CCB). Likewise, attribution theory signifies that individuals develop certain perceptions (and adapt actions accordingly) which are attributed to some internal or external factors. Here CSR being the external factor is believed to influence customers' perceptions and which in return may make them reciprocate positively (through positive attitudinal and behavioral outcomes). The affect infusion model, on the other hand, proposes that effects (emotions and moods) may influence one's judgments. As CSR investments by the firm may influence customers at an emotional level, it is perceived that customers' will think about the brand/firm (judgments) positively (Xie et al., 2017; van Tonder et al., 2018).

Though the proposed mechanism (CSR – SQ – AC – CCB) have not been investigated in the past, the need for such a study has been highlighted in literature (Ahmed et al., 2020). For instance, Engizek and Yasin (2017) highlighted that CSR should be investigated for its attitudinal and behavioral customer outcomes. If we propose the use of both commitment (attitude) and CCB (behavior) outcomes, we may fill this gap. Additionally, past studies have also valued the role of various contextual factors (Anaza, 2014; Choi and Lotz, 2018) and mechanism between those factors (Xie et al., 2017) also, while highlighting the antecedents of CCB, there may exist some explanatory mechanisms that could bring true picture and clarity. The aforementioned calls are answered through considering CSR as a contextual factor and the service quality and affective commitment as an explanatory mechanism. Moreover, Islam et al. (2019) commented that service quality should also be investigated for possible attitudinal and behavioral outcomes, which is also one of the major contributions of the current study.

The following sections of the article cover the theoretical stance and hypotheses development, followed by the methodology adopted to test those hypotheses. Findings and conclusions are later on drawn from the results. In the end, implications are discussed and the conclusion is drawn.

THEORIZATION AND HYPOTHESES DEVELOPMENT

Theoretical Underpinnings

We drew a CSR and CCB relation based on the affect infusion model (Forgas, 1995), attachment (Bowlby, 1969) and attribution theories (Heider, 1958). These theories help in linking CSR with CCB through service quality and affective commitment. The affect infusion model (AIM; Forgas, 1995) proposes that one's emotions influence cognitive judgments; and ultimately one's responses. CSR being the organizational investment aimed at society and its members may influence customers' emotions positively (Pérez and Del Bosque, 2015; Abbas et al., 2018; Xie et al., 2019), which may foster CCB.

The AT of Bowlby (1969) also explains the association, which assumes that one develops a bond with the firm or its product/service and expresses her roles in response (here CCB as a behavioral response). It is evident in literature that organizational consideration toward society and its other member positively influence the bond between the firm and the customers as they react positively (Zhu et al., 2016; Rodrigues and Costa, 2017). While assuming CSR as the care for society and its members, this study entails that such investment will foster a firm-customer bond and will make customers respond positively with high CCB (e.g., Servera-Francés and Piqueras-Tomás, 2019; Xie et al., 2019). Yet another theoretical premise is based on the Attribution theory (Heider, 1958), which proposes that humans attribute their attitude and behavior to internal or external factors. We propose that CSR as an external cause that may influence customers' attitudes and behavior toward firms investing in CSR. Past studies also highlight that CSR is perceived to be a favorable external attribute that influences customers positively (Marin and Ruiz, 2007; Lii and Lee, 2012; Plewa et al., 2015).

Hypotheses Development

CSR and Behavioral Outcomes (Customer Citizenship Behavior)

Customer citizenship behavior (CCB) has been an area of augmented interest in service literature (Yi et al., 2013), which is discretionary and covers actions such as providing feedback, assisting other customers and making suggestions for improvement (Bettencourt, 1997; Groth, 2005; Lii and Lee, 2012). Past studies are scant in providing organization-specific factors in predicting CCB (e.g., Tung et al., 2017; Zoghbi-Manrique-de-Lara et al., 2017; Choi and Lotz, 2018), and in particular, the role of CSR has largely been ignored.

The said association can be explained with the Affect Infusion Model (AIM; Forgas, 1995), which proposes that one's emotions influence cognitive judgments, here CSR is assumed to influence the emotions of customers positively, and in return influencing customers' response and behavior. It is observed that CSR influences customers' emotions positively (Lee and Yoon, 2018) and makes them respond with positive attitudinal and behavioral responses (Plewa et al., 2015). Here CCB being the discretionary behavior, is assumed to be influenced by high emotions toward a brand, which is determined by fir CSR activities (Xie et al., 2017; van Tonder et al., 2018). Similarly, AT also predicts the association of CSR and CCB by proposing that one may develop a bond with the product/service provider and reciprocate positively (e.g., CCB being the response). Past studies have witnessed that CSR investments influence customers as they show love and affection toward the brand/firm (Rodrigues and Costa, 2017). Attribution theory (Heider, 1958) undertakes that individuals attribute their actions to internal or external forces. As CSR is an external positive force (attribute) it is expected to influence customers' behaviors positively (García-Jiménez et al., 2017). Based on the given theoretical premise following association is assumed:

H1: Firm CSR activities and customers' CCB are positively related.

CSR Relation With Behavioral Outcomes Through Perceptual and Attitudinal Factors

This study also sought to test the mediation mechanism between CSR and CCB through perceptual (service quality) and attitudinal (affective commitment) factors. As discussed earlier, CSR being the external attribute may influence the emotions (Xie et al., 2017; van Tonder et al., 2018), attitude and behavior of customers (Rodrigues and Costa, 2017). So we assume that CSR will positively influence customers' emotions and they will feel positive about firms and services (service quality) and depict a positive attitude (i.e., affective commitment). Literature focuses on CSR and service quality as independent constructs predicting the same outcomes (e.g., He and Li, 2011; Kim and Kim, 2016), but the link between them is rarely investigated. Out of the few studies, Poolthong and Mandhachitra's (2009) study highlighted that customers' have a positive view about bank's CSR investment increases in their perceptions of service quality, while no such study has focused on hospitality and the food industry. We also assumed that CSR will positively influence customers' perceptions of service quality. Similarly, past studies have noticed that CSR positively influences customers' attitudinal responses (McDonald and Hung Lai, 2011; Jarvis et al., 2017), for instance, trust, brand identification (He and Li, 2011), brand image and loyalty (Kim and Kim, 2016; Servera-Francés and Piqueras-Tomás, 2019). Here affective commitment being an emotional attachment and attitudinal response (Izogo, 2017), may be influenced by the CSR activities.

We also entailed the investigation of the relationship between service quality perceptions, affective commitment and citizenship behavior of customers, which has largely been unattended in the past, but some other determinants have been reported in the past. For instance, commitment is predicted by brand experience (Johnson et al., 2008; Iglesias et al., 2019). Similarly, Fernandes and Pinto (2019) highlighted that customers' quality of interaction with service employees increases their commitment level. They also found that such customers praise service providers to others, which is an important dimension of CCB. It is also observed that provision of better services make customers feel a sense of ownership toward the firm (Béal and Sabadie, 2018), influence them at an emotional level (Aurier and Séré de Lanauze, 2012; Izogo, 2017; Islam et al., 2019), and this ultimately influences their commitment and behavior toward the firm (Ranganathan et al., 2013; Rai and Nayak, 2019). Affect infusion model (Forgas, 1995) and AT (Bowlby, 1969) can also predict this association. These theories assume emotions influence judgments of customers (Forgas, 1995) and create a bond with sources of emotions (Bowlby, 1969). Service quality is the source of emotions that may create a psychological and emotional bond (i.e., commitment) which allows customers' to make judgments and decide on behavior (i.e., CCB).

While linking customer commitment and citizenship behavior, it is observed that their attitude influences behavior, for instance, customer satisfaction (Anaza, 2014) and, commitment (Choi and Lotz, 2018; van Tonder et al., 2018). Attribution theory (Heider, 1958) can explain this relation, as CCB could be attributed to the internal or external factors, here customer commitment is a potent internal force. Based on this premise we also assume that both CSR and the service quality of customers' belief about an organization which (if positive) may influence customers' affective commitment that can lead to high CCB.

The aforementioned discussion helped us assume the link between CSR, service quality, affective commitment, and CCB which is assumed through serial mediation mechanism. The mentioned associations could be based on the AT (Bowlby, 1969) and attribution theory (Heider, 1958). Attachment theory proposes that customers may have a bond with the firm which is based on cognitive, emotional and social developments. Attribution theory provides sources of emotional relations by proposing internal and external forces being the attributions. CSR, as an external force, is found to influence emotions positively which in turn influences perceptions about service quality and affective commitment.

The value of such mechanisms is valued by past studies, for instance, Xie et al. (2017) commented that CCB association with predictors may better be explained by some explanatory mechanism. Zoghbi-Manrique-de-Lara et al. (2017) study reported that management treatment of customers influences services quality perceptions which in turn influences CCB. Thus helping us assume that firm CSR investment influences customer CCB positively. CCB has also been predicted by contextual factors (Cheng et al., 2016), while CSR could also be deemed as such a factor. On the other hand, Anaza (2014) highlighted the role of both personal and organizational factors in predicting CCB, thus both CSR and service quality can predict CCB. Tung et al. (2017) highlighted the need for future studies focusing on the effects of repeated interactions on CCB, as such interactions have lasting effects on customers. Based on this and previous sections mentioning link among variables of interest it is assumed

that the relationship between CSR and CCB is explained by both service quality perceptions and affective commitment of customers, which is hypothesized as follows:

H2: CSR and CCB positive relations are mediated by both service quality perceptions and affective commitment such that the relation is in serial mediation.

RESEARCH METHODOLOGY

The hypothesized model data was collected from customers of restaurants between April – September 2019 from two major cities of Pakistan covering Islamabad (the federal capital) and Lahore (the provincial capital of the largest province of the country). The data was collected through personally administrated questionnaires. 1,500 questionnaires were floated to the customers of 259 restaurants, while only 994 complete responses were used for analysis. The respondents included 59 male, 83% university students, 88% unmarried, and 89% regular visitors. The average age of respondents was 20.94 years. The sample could be considered useful as it has been witnessed that the hoteling trend is increasing in youth i.e., Millenials (Islam et al., 2019; Ahmed et al., 2020). The sampling technique was convenienient and was self-sampling (volunteer responses). Both the techniques have been widely used for unknown population and in marketing literature. To get better and fair results, data collection was done when the customers were dining at the selected restaurants, for which permission was taken from the management of the restaurants.

The measures used in this study are well-established and have been widely used in the past. For instance, CSR was measured using Brown and Dacin's (1997) four items scale. The exemplary items are "I believe that this restaurant acts responsibly against obesity issues." The affective commitment was measured using Mende and Bolton's (2011) three items scale which covered items such as "I enjoy being a customer of this restaurant." Service quality was measured through two dimensional (physical quality & staff behavior) using the scale of Ekinci (2001) and Ekinci et al. (2008) covering three and four items, respectively. These dimensions covered statements such as "The restaurant is tidy" and "the staff of the restaurant is helpful and friendly." Customer citizenship behavior was measured using Yi and Gong's (2008) six items scale. The results of data analysis are shown hereafter. It contained items such as "I would say positive things about this restaurant to others."

The data collected through the questionnaire was analyzed using Statistical Package for Social Sciences (SPSS) and Analysis of Moment Structure (AMOS), this is an exstensivelly used statistical software. The analysis was carried out using descriptive statistics, Structural Equation Modelling (SEM) and Hayes process macros (Hayes et al., 2017). The use of SEM has been widely accepted in social and management sciences because it uses both structural and measurement simultaneously (Hair et al., 2010).

FINDINGS

Measurement Assessment

Table 1 contains descriptive statistics and reliability results. The measures of the study were assessed on five points Likert scale. The mean scores reported in the table highlight that all the means are close to the score of four, which denoted the response of "Agree." Moreover, the reliability values, assessed through Cronbach Alpha, are (0.89–0.93) and were also well above the threshold value. It is found in the literature that reliability value of 0.65–0.80 is considered adequate for scale measuring variables of human aspects (Green et al., 1977; Vaske, 2008). Thus the scales were considered to be reliable.

Tables 2 and **3** cover the results of the adequacy of measures, which was assessed through confirmatory factor analysis (CFA) (Anderson and Gerbing, 1982; Hair et al., 2010). The table covers the values of the factor loading, average variance extracted and composite reliability. It is evident that all the items loaded well on their respective constructs as all the values are well above the threshold value of 0.60, thus the measure was assumed to be adequate. The reported values were also used to assess convergent validity which was assumed to be present, as the values of AVE were well above the threshold values of 0.5 (Fornell and Larcker, 1981; Iglesias et al., 2019). It is thus to assume that the convergent validity was present and scales met the validity assumptions. Discriminant validity was further assessed by comparing the bivariate correlation among constructs and each construct AVE square root (Hair et al., 2010). As all values exceeded the minimum limit, it was assumed that the discriminant validity was held (**Table 3**).

Common Method Biasness

As the study was one-spot in nature and data was self-reported, we sought to verify the data for the possible presence of common method variance (CMV) by using Harman's single-factor test (Podsakoff et al., 2003). We observed that a single factor only accounted for 32.87% variance (<50%) thus helping us assume that the CMV was not severe (Podsakoff et al., 2003). Moreover, CMV was also assumed not to be severe as the correlation values were below threshold (i.e., <0.9; Pavlou et al., 2007).

Results of Hypotheses Testing

Hypotheses testing results are shown in **Table 4**. The table contains the results of both the hypotheses. At first instance, the result of the direct relationship between

TABLE 1 | Descriptive statistics.

Study variables	Cronbach alpha	Descriptives	
		Mean	SD
Perceived CSR	0.91	3.958	0.905
Service quality perceptions	0.89	4.320	0.692
Affective commitment	0.93	3.890	0.852
Customer citizenship behavior	0.90	3.840	0.849

TABLE 2 | Confirmatory factor analysis.

Construct	Item	Loading	CR	AVE
Perceived CSR	This restaurant is considering customers' health	0.74	0.91	0.90
	This restaurant acts responsibly against obesity issues	0.88		
	This restaurant has a sense of responsibility to customer's health	0.94		
	This restaurant is socially responsible	0.79		
Service quality	The décor of the restaurant is beautifully coordinated with great attention to details	0.80	0.90	0.82
perceptions	The restaurant is tidy	0.79		
	The restaurant provides a comfortable room	0.83		
	The staff of the restaurant is helpful and friendly	0.89	0.89	0.79
	The staff of the restaurant seems to anticipate what I want	0.88		
	The staff of the restaurant listens to me	0.76		
	The staff of the restaurant is talented	0.89		
Affective	I enjoy being a customer of this restaurant	0.79	0.90	0.77
commitment	I have positive feelings about this restaurant	0.84		
	I feel attached to this restaurant	0.90		
Customer	I would say positive things about this restaurant	0.89	0.89	0.80
citizenship	I would give constructive suggestions to this restaurant on how to improve its services	0.80		
Behavior	When I have a useful idea on how to improve service, I would communicate it to someone in this restaurant	0.91		
	When I experience a problem in this restaurant, I would let someone know so that they can improve the service	0.87		
	I would do things that make the employees' job easier	0.79		
	I would carefully observe the rules and policies of this restaurant	0.88		

TABLE 3 | Discriminant validity.

	PCSR	SQ	AC	CCB
PCSR	**0.81**[a]	–	–	–
SQ	0.63[b]	**0.79**	–	–
AC	0.60	0.68	**0.94**	–
CCB	0.59	0.58	0.69	**0.89**

[a]*AVE square root in diagonal.* [b]*Bivariate correlation among constructs.*

service quality and customer citizenship is reported. It is evident from the table that CSR is significantly and positively related with CCB (0.3985; $p < 0.001$), which helps us infer that when restaurants invest in the CSR activities, customers respond with positive behavior beyond their traditional roles (extra-role behavior – CCB), thus H1 is supported.

As this study also entailed that the investigation of an indirect relationship between CSR and CCB through serial mediation of service quality and affective commitment, the remaining part of the table covered the results of serial mediation mechanism. The findings highlight that the relationship between CSR and CCB through the serial mediators (service quality and affective commitment) is significant (0.1613, Boots SE 0.0063). The results proved to be significant as there was no presence of non-zero and the signs of both ULCI and LLCI were positive (LLCI 0.0021 and ULCI 0.0263). These results helped us conclude that H2 was also supported. The results thus explain that the CSR efforts of a restaurant will cause improved service quality perceptions and affective commitment of customers and in turn, their citizenship behavior will upsurge.

DISCUSSION AND CONCLUSION

This study has focused on investigating the perceptual (service quality), attitudinal (affective commitment) and behavioral (customer citizenship behavior) outcomes of CSR. The need for this study had been highlighted and called up by past studies (e.g., Xie et al., 2017; Zoghbi-Manrique-de-Lara et al., 2017; Choi and Lotz, 2018; Islam et al., 2019). For instance, Engizek and Yasin (2017) invited researchers to investigate the attitudinal and

TABLE 4 | Path analysis results.

Hypotheses	Path	Estimate	SE	*p*	CI	Result
H1	CSR–CCB	0.3985	0.014	0.0000	[0.339; 0.440]	Supported
Hypotheses	**Path**	**Estimate**	**Boot SE**	**Boot LLCI**	**Boot ULCI**	
H2	PCSR-SQ-AC-CCB	0.1613	0.0063	0.0021	0.0263	

CSR, corporate social responsibility; CCB, customer citizenship behavior; SQ, service quality; AC, affective commitment.

behavioral outcomes of CSR in tandem. While investigating the predictors of CCB, Choi and Lotz (2018) invited future researchers to focus on contextual factors. CSR being the contextual factor, is found to influence CCB significantly.

The study also entailed the investigation of mediation mechanism between CSR and CCB through service quality and affective commitment, which has also been directed by past studies. For example, Tung et al. (2017) commented that CCB studies should focus on repeated interactions and psychological mechanisms predicting it. Islam et al. (2019) also valued such mechanism, as they commented that service quality outcomes should cover both attitudinal and behavioral variables in a mechanism. Our findings proved that CCB is influenced by a mechanism (through a serial mediation), which covers perceptual, attitudinal and behavioral variables. These findings were in-line with past studies; for instance, Jarvis et al. (2017) also reported that CSR influences customers' emotional, attitudinal and behavioral responses. The emotional and attitudinal outcomes have also been investigated in other studies as well (e.g., Poolthong and Mandhachitara, 2009; He and Li, 2011; McDonald and Hung Lai, 2011; Kim and Kim, 2016; Fernandes and Pinto, 2019; Iglesias et al., 2019; Servera-Francés and Piqueras-Tomás, 2019). Béal and Sabadie (2018) and Izogo (2017) also found that taking care of society and customers, influences customers and they generate positive perceptions that ultimately affects their response.

These findings support the hypotheses, past studies and theoretical premise of the study. The findings prove that customers attribute their behavior to external factors (here CSR; attribution theory, Heider, 1958). While CSR could also be presumed to be a force that may cause a bond between customers and a firm, and can make them reinforce relationships (CCB; AT, Heider, 1958). The said association also supports presumptions of the affect infusion model (Forgas, 1995) which proposes the value of emotions in making judgments and responses. Here it is observed that CSR works at an emotional level and influences judgments (perceptions and attitudes – service quality and affective commitment) and responses (behavior – CCB).

The findings discussed in the highlight of the aforementioned section show that this study entails some novel explanations linking CSR with CCB through perceptual and attitudinal factors as a serial mediation mechanism. Past studies have not linked CSR and service quality, rather investigated them as independent variables in the models (e.g., He and Li, 2011; Kim and Kim, 2016). The serial mediation model was supposed using theoretical triangulation, i.e., affect infusion model (Forgas, 1995), attachment (Bowlby, 1969) and attribution theories (Heider, 1958), and the findings of the study stand tall with the theoretical assumptions made in these studies.

Additionally, this study adds value by generating a useful message for the managers of restaurants, due to increased competition in the food industry it has become imperative for management to generate loyal customers having a high level of citizenship behavior (Islam et al., 2019; Ahmed et al., 2020). While looking at the ways of increasing CCB it has been suggested that customers should be given employee like treatment. The study offers a novel explanation to the managers of the restaurants, as they can improve the CCB by increasing the CSR investments. Moreover, this study provides a complete mechanism that covers perceptual, attitudinal and behavioral outcomes offered by CSR investments. Although CSR has been widely recognized as a tool to boost profits and employees' responses, the outcomes focusing on the customers' responses have not been managerially evaluated (Huang et al., 2019).

Though this study assumes and tests a novel mechanism and offers wider implications, it is still prone to some limitations. The foremost is the use of cross-sectional design, as it was not possible to approach customers with intervals (for lag or longitudinal study). Though the CMV was not a severe yet longitudinal design, it may offer better results. The sample of the study consisted of millennials only while the other age cohorts may offer different results. This study also entails the investigation of service quality through only two dimensions (i.e., physical quality and staff behavior), while it has been investigated through tangible and intangible service factors which could be an important consideration for future studies. As this study covers attitudinal and behavioral outcomes, future studies may focus on other variables (e.g., engagement, patronage intentions, WOM). Future studies could also investigate CCB as a multidimensional construct and evaluate them independently.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any qualified researcher.

AUTHOR CONTRIBUTIONS

IAh, MN, IAl, and FA contributed in: definition of research objectives, developing models, hypotheses, data analysis plan, article writing, revision/proofreading, and final approval. AK and MS contributed in data collection, analysis, drawing limitations, future directions and conclusion of the study.

ETHICS STATEMENT

This study involving human participants was reviewed and approved by the Ethics Committee of the Hailey College of Commerce, University of the Punjab, Lahore, Pakistan. The participants provided their written informed consent to participate in this study.

REFERENCES

Abbas, M., Gao, Y., and Shah, S. (2018). CSR and customer outcomes: the mediating role of customer engagement. *Sustainability* 10:4243. doi: 10.3390/su10114243

Ahmed, I., Nazir, M. S., Ali, I., Nurunnabi, M., Khalid, A., and Shaukat, M. Z. (2020). Investing in CSR pays you back in many ways! The case of perceptual, attitudinal and behavioral outcomes of customers. *Sustainability* 12:1158. doi: 10.3390/su12031158

Anaza, N. A. (2014). Personality antecedents of customer citizenship behaviors in online shopping situations. *Psychol. Market.* 31, 251–263. doi: 10.1002/mar.20692

Anderson, J. C., and Gerbing, D. W. (1982). Some methods for respecifying measurement models to obtain unidimensional construct measurement. *J. Mark. Res.* 19, 453–460. doi: 10.1177/002224378201900407

Asrar-ul-Haq, M., Kuchinke, K. P., and Iqbal, A. (2017). The relationship between corporate social responsibility, job satisfaction, and organizational commitment: case of Pakistani higher education. *J. Clean. Prod.* 142, 2352–2363. doi: 10.1016/j.jclepro.2016.11.040

Aurier, P., and Séré de Lanauze, G. (2012). Impacts of perceived brand relationship orientation on attitudinal loyalty: an application to strong brands in the packaged goods sector. *Eur. J. Market.* 46, 1602–1627. doi: 10.1108/03090561211260004

Bartikowski, B., and Walsh, G. (2011). Investigating mediators between corporate reputation and customer citizenship behaviors. *J. Bus. Res.* 64, 39–44. doi: 10.1016/j.jbusres.2009.09.018

Béal, M., and Sabadie, W. (2018). The impact of customer inclusion in firm governance on customers' commitment and voice behaviors. *J. Bus. Res.* 92, 1–8. doi: 10.1016/j.jbusres.2018.07.019

Bettencourt, L. A. (1997). Customer voluntary performance: customers as partners in service delivery. *J. Retail.* 73, 383–406. doi: 10.1016/S0022-4359(97)90024-5

Blowfield, M., and Murray, A. (2014). *Corporate Responsibility*. London: Oxford University Press.

Bowlby, J. (ed.) (1969). "Attachment and loss: volume I: attachment," in *Attachment and Loss: Volume I: Attachment*, (London: The Hogarth Press and the Institute of Psycho-Analysis), 1–401.

Brown, T. J., and Dacin, P. A. (1997). The company and the product: corporate associations and consumer product responses. *J. Mark.* 61, 68–84. doi: 10.1177/002224299706100106

Carroll, A. B. (2016). Carroll's pyramid of CSR: taking another look. *Int. J. Corp. Soc. Res.* 1, 1–8. doi: 10.1186/s40991-016-0004-6

Cheng, J. C., Luo, S. J., Yen, C. H., and Yang, Y. F. (2016). Brand attachment and customer citizenship behaviors. *Serv. Ind. J.* 36, 263–277. doi: 10.1080/02642069.2016.1186658

Choi, L., and Lotz, S. L. (2018). Exploring antecedents of customer citizenship behaviors in services. *Serv. Ind. J.* 38, 607–628. doi: 10.1080/02642069.2017.1414194

D'Amato, A., and Falivena, C. (2019). Corporate social responsibility and firm value: do firm size and age matter? Empirical evidence from European listed companies. *Corp. Soc. Responsib. Environ. Manag.* 27, 909–924. doi: 10.1002/csr.1855

Ekinci, Y. (2001). The validation of the generic service quality dimensions: an alternative approach. *J. Retail. Cons. Serv.* 8, 311–324. doi: 10.1016/S0969-6989(00)00037-0

Ekinci, Y., Dawes, P. L., and Massey, G. R. (2008). An extended model of the antecedents and consequences of consumer satisfaction for hospitality services. *Eur. J. Market.* 42, 35–68. doi: 10.1108/03090560810840907

Engizek, N., and Yasin, B. (2017). How CSR and overall service quality lead to affective commitment: mediating role of company reputation. *Soc. Resp. J.* 13, 111–125. doi: 10.1108/SRJ-09-2015-0135

Fernandes, T., and Pinto, T. (2019). Relationship quality determinants and outcomes in retail banking services: the role of customer experience. *J. Retail. Cons. Serv.* 50, 30–41. doi: 10.1016/j.jretconser.2019.01.018

Forbes (2019). Available online at: https://www.forbes.com/sites/rachelsandler/2019/08/19/nearly-200-ceos-say-shareholder-profit-isnt-everything/ (accessed December 14, 2019).

Forgas, J. P. (1995). Mood and judgment: the affect infusion model (AIM). *Psychol. Bull.* 117, 39–66. doi: 10.1037/0033-2909.117.1.39

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312

García-Jiménez, J. V., Ruiz-de-Maya, S., and López-López, I. (2017). The impact of congruence between the CSR activity and the company's core business on consumer response to CSR. *Span. J. Market.* 21, 26–38. doi: 10.1016/j.sjme.2017.01.001

Gilal, F. G., Ashraf, Z., Gilal, N. G., Gilal, R. G., and Chaana, N. A. (2019). Promoting environmental performance through green human resource management practices in higher education institutions: a moderated mediation model. *Cor. Soc. Resp. Env. Manag.* 26, 1579–1690. doi: 10.1002/csr.1835

Green, S. B., Lissitz, R. W., and Mulaik, S. A. (1977). Limitations of coefficient alpha as an index of test unidimensionality. *Educ. Psychol. Meas.* 37, 827–838. doi: 10.1177/001316447703700403

Groth, M. (2005). Customers as good soldiers: examining citizenship behaviours in internet service deliveries. *J. Manag.* 31, 7–27. doi: 10.1177/0149206304271375

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective*, 7th Edn. Boston MA: Pearson.

Hayes, A. F., Montoya, A. K., and Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: process versus structural equation modeling. *Austral. Mark. J.* 25, 76–81. doi: 10.1016/j.ausmj.2017.02.001

He, H., and Li, Y. (2011). CSR and service brand: the mediating effect of brand identification and the moderating effect of service quality. *J. Bus. Ethics* 100, 673–688. doi: 10.1007/s10551-010-0703-y

Heider, F. (1958). *The Psychology of Interpersonal Relations*. New York, NY: John Wiley & Sons.

Huang, Y. F., Do, M. H., and Kumar, V. (2019). Consumers' perception on corporate social responsibility: evidence from Vietnam. *Corp. Soc. Responsib. Environ. Manag.* 26, 1272–1284. doi: 10.1002/csr.1746

Iglesias, O., Markovic, S., and Rialp, J. (2019). How does sensory brand experience influence brand equity? Considering the roles of customer satisfaction, customer affective commitment, and employee empathy. *J. Bus. Res.* 96, 343–354. doi: 10.1016/j.jbusres.2018.05.043

Islam, J. U., Hollebeek, L. D., Rahman, Z., Khan, I., and Rasool, A. (2019). Customer engagement in the service context: an empirical investigation of the construct, its antecedents and consequences. *J. Retail. Cons. Serv.* 50, 277–285. doi: 10.1016/j.jretconser.2019.05.018

Izogo, E. E. (2017). Customer loyalty in telecom service sector: the role of service quality and customer commitment. *TQM J.* 29, 19–36. doi: 10.1108/TQM-10-2014-0089

Jarvis, W., Ouschan, R., Burton, H. J., Soutar, G., and O'Brien, I. M. (2017). Customer engagement in CSR: a utility theory model with moderating variables. *J. Serv. Theor. Prac.* 27, 833–853. doi: 10.1108/JSTP-04-2016-0081

Johnson, M. S., Sivadas, E., and Garbarino, E. (2008). Customer satisfaction, perceived risk and affective commitment: an investigation of directions of influence. *J. Serv. Market.* 22, 353–362. doi: 10.1108/08876040810889120

Kim, S. B., and Kim, D. Y. (2016). The impacts of corporate social responsibility, service quality, and transparency on relationship quality and customer loyalty in the hotel industry. *Asian J. Sustain. Soc. Resp.* 1, 39–55. doi: 10.1186/s41180-016-0004-1

Latif, K. F., and Sajjad, A. (2018). Measuring corporate social responsibility: a critical review of survey instruments. *Corp. Soc. Responsib. Environ. Manag.* 25, 1174–1197. doi: 10.1002/csr.1630

Lee, E. M., and Yoon, S. J. (2018). The effect of customer citizenship in corporate social responsibility (CSR) activities on purchase intention: the important role of the CSR image. *Soc. Resp. J.* 14, 753–763. doi: 10.1108/SRJ-04-2017-0074

Lii, Y. S., and Lee, M. (2012). Doing right leads to doing well: when the type of CSR and reputation interact to affect consumer evaluations of the firm. *J. Bus. Ethics* 105, 69–81. doi: 10.1007/s10551-011-0948-0

Marin, L., Martín, P. J., and Rubio, A. (2017). Doing good and different! The mediation effect of innovation and investment on the influence of CSR on competitiveness. *Corp. Soc. Responsib. Environ. Manag.* 24, 159–171. doi: 10.1002/csr.1412

Marin, L., and Ruiz, S. (2007). I need you too: corporate identity attractiveness for consumer and the role of social responsibility. *J. Bus. Ethics* 71, 245–260. doi: 10.1007/s10551-006-9137-y

Marin, L., Ruiz, S., and Rubio, A. (2009). The role of identity salience in the effects of corporate social responsibility on consumer behavior. *J. Bus. Ethics* 84, 65–78. doi: 10.1007/s10551-008-9673-8

McDonald, L. M., and Hung Lai, C. (2011). Impact of corporate social responsibility initiatives on Taiwanese banking customers. *J. Bank Mark.* 29, 50–63. doi: 10.1108/02652321111101374

Mende, M., and Bolton, R. N. (2011). Why attachment security matters: how customers' attachment styles influence their relationships with service firms and service employees. *J. Serv. Res.* 14, 285–301. doi: 10.1177/1094670511411173

Mills, P. K., Chase, R. B., and Margulies, N. (1983). Motivating the client/employee system as a service production strategy. *Acad. Manage. Rev.* 8, 301–310. doi: 10.5465/amr.1983.4284740

Pavlou, P. A., Liang, H., and Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: a principal-agent perspective. *MIS Q.* 31, 105–136. doi: 10.2307/25148783

Pérez, A., and Del Bosque, I. R. (2015). An integrative framework to understand how CSR affects customer loyalty through identification, emotions and satisfaction. *J. Bus. Ethics* 129, 571–584. doi: 10.1007/s10551-014-2177-9

Plewa, C., Conduit, J., Quester, P. G., and Johnson, C. (2015). The impact of corporate volunteering on CSR image: a consumer perspective. *J. Bus. Ethics* 127, 643–659. doi: 10.1007/s10551-014-2066-2

Podsakoff, P. M., Mackenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. App. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Poolthong, Y., and Mandhachitara, R. (2009). Customer expectations of CSR, perceived service quality and brand effect in Thai retail banking, I. *J. Bank Market.* 27, 408–427. doi: 10.1108/02652320910988302

Rai, S., and Nayak, J. K. (2019). Hospitality branding in emerging economies: an Indian perspective. *J. Tourism Future* 5, 22–34. doi: 10.1108/JTF-07-2018-0047

Ranganathan, S. K., Madupu, V., Sen, S., and Brooks, R. J. (2013). Affective and cognitive antecedents of customer loyalty towards e-mail service providers. *J. Serv. Market.* 27, 195–206. doi: 10.1108/08876041311330690

Rodrigues, P., and Costa, P. (2017). The effect of the consumer perceptions of CSR in brand love. *Paper Presented in 12th global brand conference of the Academy of Marketing, At School of Business & Economics*, (Kalmar: Linnaeus Univesity).

Sarfraz, M., Qun, W., Abdullah, M. I., and Alvi, A. T. (2018). Employees' perception of corporate social responsibility impact on employee outcomes: mediating role of organizational justice for small and medium enterprises (SMEs). *Sustainability* 10:2429. doi: 10.3390/su10072429

Sarfraz, M., Qun, W., Sarwar, A., Abdullah, M. I., Imran, M. K., and Shafique, I. (2019). Mitigating effect of perceived organizational support on stress in the presence of workplace ostracism in the Pakistani nursing sector. *Psychol. Res. Behav. Manage.* 12, 839–849. doi: 10.2147/PRBM.S210794

Servera-Francés, D., and Piqueras-Tomás, L. (2019). The effects of corporate social responsibility on consumer loyalty through consumer perceived value. *Ecol. Res.* 32, 66–84. doi: 10.1080/1331677X.2018.1547202

Shah, S. G. M., Tang, M., Sarfraz, M., and Fareed, Z. (2019). The aftermath of CEO succession via hierarchical jumps on firm performance and agency cost: evidence from Chinese firms. *Appl. Econ. Lett.* 26, 1744–1748. doi: 10.1080/13504851.2019.1593932

Story, J. S., and Castanheira, F. (2019). Corporate social responsibility and employee performance: mediation role of job satisfaction and affective commitment. *Corp. Soc. Responsib. Environ. Manag.* 26, 1361–1370. doi: 10.1002/csr.1752

Tung, V. W. S., Chen, P. J., and Schuckert, M. (2017). Managing customer citizenship behaviour: the moderating roles of employee responsiveness and organizational reassurance. *Tourism Manage.* 59, 23–35. doi: 10.1016/j.tourman.2016.07.010

van Tonder, E., Saunders, S. G., Lisita, I. T., and de Beer, L. T. (2018). The importance of customer citizenship behaviour in the modern retail environment: introducing and testing a social exchange model. *J. Retail. Cons. Serv.* 45, 92–102. doi: 10.1016/j.jretconser.2018.08.011

Vaske, J. J. (2008). *Survey Research and Analysis: Applications in Parks, Recreation and Human Dimensions*. State College, PA: Venture.

Xie, C., Bagozzi, R. P., and Grønhaug, K. (2019). The impact of corporate social responsibility on consumer brand advocacy: the role of moral emotions, attitudes, and individual differences. *J. Bus. Res.* 95, 514–530. doi: 10.1016/j.jbusres.2018.07.043

Xie, L., Poon, P., and Zhang, W. (2017). Brand experience and customer citizenship behavior: the role of brand relationship quality. *J. Cons. Market.* 34, 268–280. doi: 10.1108/JCM-02-2016-1726

Yi, Y., and Gong, T. (2008). The effects of customer justice perception and affect on customer citizenship behavior and customer dysfunctional behavior. *Indus. Market. Manage.* 37, 767–783. doi: 10.1016/j.indmarman.2008.01.005

Yi, Y., Gong, T., and Lee, H. (2013). The impact of other customers on customer citizenship behavior. *Psychol. Market.* 30, 341–356. doi: 10.1002/mar.20610

Yi, Y., Nataraajan, R., and Gong, T. (2011). Customer participation and citizenship behavioral influences on employee performance, satisfaction, commitment, and turnover intention. *J. Bus. Res.* 64, 87–95. doi: 10.1016/j.jbusres.2009.12.007

Zhu, D. H., Sun, H., and Chang, Y. P. (2016). Effect of social support on customer satisfaction and citizenship behavior in online brand communities: the moderating role of support source. *J. Retail. Cons. Serv.* 31, 287–293. doi: 10.1016/j.jretconser.2016.04.013

Zoghbi-Manrique-de-Lara, P., Suárez-Acosta, M. A., and Guerra-Báez, R. M. (2017). Customer citizenship as a reaction to hotel's fair treatment of staff: service satisfaction as a mediator. *Tourism Hosp. Res.* 17, 190–203. doi: 10.1177/1467358415613394

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Cognitive Bias, Entrepreneurial Emotion, and Entrepreneurship Intention

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Although numerous studies have explored the factors influencing entrepreneurial activity, there is a lack of a theoretical basis for linking these factors to entrepreneurship behavioral intention. The current study uses the theory of self-regulating attitude to construct a theoretical model of examining the relationship among cognitive bias, entrepreneurial emotion, and entrepreneurship intention. A total of 312 valid samples were collected from college students at a Chinese university. The bootstrapping method was used to test the multi-mediation hypotheses. Our research found that positive entrepreneurial emotion plays a mediating role in the relationship between optimism and entrepreneurship intention, whereas negative entrepreneurial emotion plays a mediating role in the relationship between overconfidence and entrepreneurship intention. These findings underline the importance of a correct understanding of cognitive bias and entrepreneurial emotion in the process of entrepreneurship.

Keywords: cognitive bias, entrepreneurial emotion, entrepreneurship intention, optimism, overconfidence

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INTRODUCTION

Entrepreneurship plays a vital role in economic development, job creation, and social welfare (Poblete et al., 2019; Ravenelle, 2019). However, entrepreneurial behaviors are not growing as quickly as expected (Randerson et al., 2020). In particular, individuals with similar demographic characteristics have large differences in their entrepreneurial behaviors (Obschonka et al., 2012; Amarakoon et al., 2019). What causes these individuals to differ in their intention to start a business?

Entrepreneurial traits and entrepreneurship cognition theory explain the impact of personality traits, achievement needs, control focus, risk-taking, and other factors on entrepreneurial behavior from the perspective of individual entrepreneurs (Obschonka et al., 2012; Neneh, 2019; Perez-Lopez et al., 2019). However, entrepreneurial characteristics, which are individually owned cognition and judgment, are distinct (Wang et al., 2019). Thus, there is still space for further study of the differences in entrepreneurial cognition shown by individuals. It is not appropriate to use cognitive mechanisms to predict who will choose to become entrepreneurs without considering the sources of cognition. Perez-Lopez et al. (2019) point out that the core of entrepreneurship cognition theory should focus on cognitive characteristics and how they influence individual attitudes, intentions, and behaviors, emphasizing the important role played by contextual factors in entrepreneurship cognition theory.

In previous studies, the role of entrepreneurial cognitive bias has not attracted enough attention. Cognitive bias is generally considered a negative factor (Krans et al., 2019). Cognitive biases include different types of dimensions, however, such as optimism and overconfidence. With the advantage of quick, minimalist decision-making (Onie et al., 2019), more precise judgments occur due to the lack of resources to reference (Bosmans et al., 2019). In a rapidly changing environment, it is a challenging task for a rational decision-maker to take advantage of all available information and seize opportunities. Once a decision is made, there is no possibility of opportunity. In such a complex environment, different types of cognitive bias will play distinct roles in the creation of entrepreneurial intention (Hahn et al., 2019). Previous literature regarding entrepreneurial intention used the theory of planned behavior (Ajzen, 1991), which considered entrepreneurship a planned behavior of the relevant intention, and defined entrepreneurial intention as mental representations of a person's propensity to start a business (Obschonka et al., 2015; Gorgievski et al., 2018). Bagozzi (1992) points out that classical attitude theory simplifies the use of general psychological variables to explain social behavior, and simplifies many beliefs and evaluations into an overall, single-dimensional attitude, so these theories lack the explanatory power to change.

Moreover, in previous studies, the important role of entrepreneurial emotion has not attracted sufficient attention, and less systematic research has attempted to explain the potential role of emotion in the entrepreneurial process (Cardon et al., 2012; Hu et al., 2017). Some studies have found, however, that individual decisions at different stages of entrepreneurship are influenced by emotion and reason (Cardon et al., 2012), and significant differences exist in the impact of types of emotions on the assessment of entrepreneurial opportunities (Wolfe and Shepherd, 2015). These studies ignore the role of different types of emotions in the relationship between cognition and entrepreneurship behavior (Doern and Goss, 2013). Indeed, the emotions that an individual or team has on entrepreneurship include both positive and negative emotions (Wolfe and Shepherd, 2015), and different emotional reactions of the individual have distinct effects on the outcomes of behavioral variables.

Bagozzi (1992) points out that behavior is a response activity that stems from an individual's assessment of the situation and subsequent emotional responses. Specific assessments and desires are functions of unique stimuli that lead to specific emotions and coping responses. The self-regulating process of evaluation, emotional response, and coping response is the core of the theory. Cognitive bias is a characteristic of employees' perception of the entrepreneurial environment. Individuals generate different emotions and attitudes based on this environmental assessment, which further determine the individual's entrepreneurial intentions and behavior. Given the preceding arguments, this study follows the theory of self-regulating attitude, establishes a research model of evaluation, emotional reaction, and coping response, and explores the influence of cognitive bias on entrepreneurship intention through the mediating effect of entrepreneur emotions.

LITERATURE REVIEW AND HYPOTHESIS

Self-Regulating Attitude Theory

On the theoretical basis of traditional attitude, Bagozzi (1992) put forward the theory of self-regulating attitude. The self-regulating process of evaluation, emotional reaction, and coping response is at the heart of the theory (Lazarus, 1991). The theory states that behavior is a response activity that results from an individual's assessment of the situation and subsequent emotional reaction. Specific assessments and desires are functions of unique stimuli that lead to specific emotions and coping responses. The theory distinguishes between the evaluation process and the emotional reaction process, emphasizing the role of cognitive and emotional self-regulation mechanisms in attitude theory. Thus, it expands the interpretation of social behavior.

Some scholars have applied this theory to the empirical research of employee attitude and behavior (Kruglanski et al., 2015; Rhodes et al., 2016; Hansen and Steinmetz, 2019). However, no scholars have introduced the model into the study of entrepreneurship psychology. Using the theory of self-regulating attitude, this study proposes that cognitive bias is an individual's assessment of the external working environment and practices. Cognitive bias is considered to be a precursor to an employee's emotional response. Entrepreneurial emotion is an important emotional response variable in an individual's entrepreneurship process. Entrepreneurship intention is the behavioral outcome after an individual's emotional response. The conceptual framework for this study is shown in **Figure 1**.

Relationship Between Cognitive Bias and Entrepreneurship Intention

Cognitive bias is an individual's perceptual deviation from rationality when thinking, reasoning, and making decisions (Alos-Ferrer et al., 2016; Domeier and Sachse, 2016; Marchetti et al., 2019). Different cognitive biases will trigger differences in the perception of the internal and external environment for each individual, which, in turn, will affect

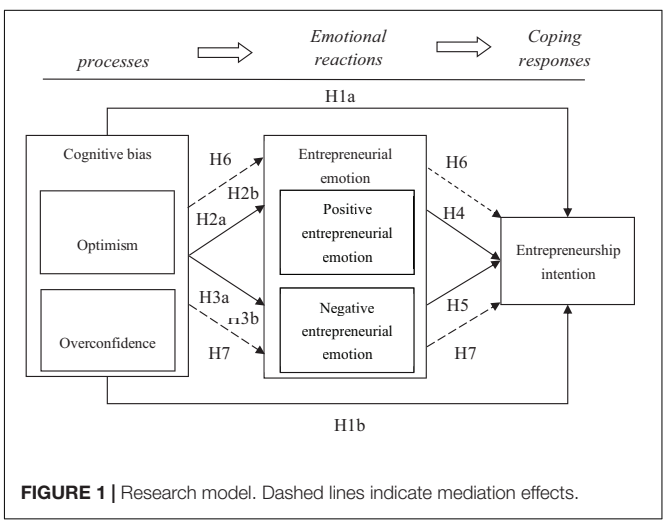

FIGURE 1 | Research model. Dashed lines indicate mediation effects.

their entrepreneurial emotions. Kinari (2016) argued that optimism and overconfidence are closely related to the cognitive bias of entrepreneurship. Optimism refers to the tendency to underestimate the difficulty of task (Heger and Papageorge, 2018), while overconfidence is the tendency to overestimate the chance of positive events (Chaudhary, 2018).

Although cognitive bias is seen as having a negative effect (Giacomin et al., 2016), it may be a cognitive mechanism for making quick decisions (Bernoster et al., 2018). When an entrepreneur is faced with a complex environment, it helps entrepreneurs make quick decisions because cognitive biases do not require much time or cognitive resources. This has led scholars to present consequences of cognitive bias.

In the case of optimism and entrepreneurship intention, optimists ignore uncertainty and are only slightly aware of the level of risk (Trevelyan, 2008). They overrated the chances of successfully starting a real business (Heger and Papageorge, 2018). Optimism also increases entrepreneurs' commitment to risky causes (Joo and Durri, 2017) and causes delays or helps suspend decisions on unsuccessful schemes (Trevelyan, 2008). Conversely, overconfident entrepreneurs tend to overestimate the probability of a particular outcome, treating assumptions as facts, leading to insufficient searches for information (Zacharakis and Shepherd, 2001). These entrepreneurs fail to gather relevant information, which affects the quality of decision-making, leading to entrepreneurial setbacks, thereby reducing the actual intention to start a business (Hayward et al., 2010). This study posits that the two types of cognitive bias differentially predict entrepreneurship intention:

> Hypothesis 1a. Optimism is positively linked with entrepreneurship intention.
>
> Hypothesis 1b. Overconfidence is negatively linked with entrepreneurship intention.

Relationship Between Cognitive Bias and Entrepreneurial Emotion

Entrepreneurial emotion refers to an emotion held by an individual about entrepreneurship (Cardon et al., 2012). Previous literature on entrepreneurial emotion has not paid much attention to individual cognitive processes. Recent research has indicated that individual decision-making at different stages of entrepreneurship is influenced by emotion and rationality (Grichnik et al., 2011; Doern and Goss, 2013). Additionally, emotion is an important factor influencing employee output and customer service perception behavior and is regulated by situational and organizational factors (Byrne and Shepherd, 2015; Wolfe and Shepherd, 2015; Hu et al., 2017).

Some empirical evidence supports self-regulating attitude theory as a relevant framework for explaining how cognitive bias influences entrepreneurial emotion (Chen et al., 2018). Optimists' over self-evaluation and overly positive view of future events' results and plans (Bernoster et al., 2018) easily lead to positive emotions (Giacomin et al., 2016). Conversely, overconfidence overestimates an individual's actual performance (Joo and Durri, 2017). Lack of personal knowledge can easily lead to failure of entrepreneurship, which, in turn, leads to negative emotions (Kinari, 2016). Based on self-regulating attitude theory, specific assessments and desires are functions of unique stimuli that lead to specific emotions and coping responses.

Some studies have found that good service climate may have an impact on employees' job satisfaction (Schneider et al., 2003), while a general negative affect may result from a poor climate appraisal (Schmit and Allscheid, 1995; Rhodes et al., 2016; Hansen and Steinmetz, 2019). The study assumes that positive entrepreneurial emotion is the emotional reaction to the optimism appraisal processes, while negative entrepreneurial emotion is the emotional reaction to overconfidence. Accordingly, the study tested the following hypotheses:

> Hypothesis 2a. Optimism is negatively associated with negative entrepreneurial emotion.
>
> Hypothesis 2b. Optimism is positively associated with positive entrepreneurial emotion.
>
> Hypothesis 3a. Overconfidence is negatively associated with positive entrepreneurial emotion.
>
> Hypothesis 3b. Overconfidence is positively associated with negative entrepreneurial emotion.

Relationship Between Entrepreneurial Emotion and Entrepreneurship Intention

Although emotional labor is regarded as a predictor of future behavior (Fouquereau et al., 2019), current research on entrepreneurship rarely involves specific behaviors of entrepreneurship (Liu et al., 2019). Recently, some scholars have pointed out that entrepreneurial passion has a significant impact on opportunity recognition and entrepreneurial behaviors (Richards et al., 2019; Wu et al., 2020). Entrepreneurial passion is a part of entrepreneurial emotion, and it may trigger entrepreneurial behavior because it is an individual's conscious experience, and is conducive to better personal investment in entrepreneurial activities (Li et al., 2017; Obschonka et al., 2019).

In terms of the theory of self-regulating attitude, individual emotional reactions have different effects on behavioral variables. For example, employees' affective commitment is positively related to service recovery performance, and fear is positively related to idleness (Babakus et al., 2003). In the process of entrepreneurship, positive entrepreneurial emotion can significantly affect the behavior and state of individuals and help entrepreneurs to actively respond to highly uncertain and high-risk entrepreneurial environments, thus triggering risk-seeking behavior. Thus, the individual will form an uplifting mental state, actively engage in entrepreneurship, and will show long-term persistence (Schulte-Holthaus, 2019). On the contrary, individuals who hold negative emotions will show a less optimistic response to the external entrepreneurial environment, hesitate to act, and even miss out on development opportunities (Santos and Cardon, 2019). Hence, this study proposes that positive entrepreneurial emotion and entrepreneurship intention are negatively correlated, while negative entrepreneurial emotion

and entrepreneurship intention are positively correlated. Based on the above, the present work argues:

Hypothesis 4. Positive entrepreneurial emotion is negatively associated with entrepreneurship intention.

Hypothesis 5. Negative entrepreneurial emotion is positively associated with entrepreneurship intention.

The Mediating Role of Emotional Reactions

In existing literature, aside from testing the direct relationship between cognitive bias and entrepreneurship intention, Dali and Harbi (2016) argue that cognitive bias may explain why some individuals' entrepreneurial behavior results in success while others result in failure. Similarly, some researchers found that enterprise founders tend to have a higher risk bias and perceive lower risk, making strategic decisions faster (Dolarslan et al., 2017). In particular, those studies find that different types of cognitive bias will trigger differences in individual perceptions of the internal and external environment, which will have an impact on their identification and utilization of valuable opportunities. However, they do not explore the mediating role of emotional factors, such as entrepreneurial emotion.

Past studies have demonstrated that positive emotions can be used as additional information to help individuals understand the difficulties optimistically (Huxtable-Thomas et al., 2016; O'Shea et al., 2017). This greatly reduces the risk that enterprise founders perceive in the entrepreneurial process, allowing them to assume that they can control the uncertainties and outcomes of internal and external environments, so that they can make the appropriate entrepreneurial decisions quickly. In contrast to positive emotions, negative emotions reduce the perceived environmental certainty and control of individuals, increase perceived risks, and hinder rapid decision-making behavior (He et al., 2018; Alessa, 2019). Therefore, cognitive bias affects the corresponding entrepreneurial behavior through different types of emotion. Thus, this study argues that the individual with high levels of optimism will react with positive entrepreneurial emotion, thus increasing the likelihood of experiencing entrepreneurship intention. Conversely, the individual with high levels of overconfidence will react with negative entrepreneurial emotion to avoid the threat of entrepreneurship intention.

Based on self-regulating attitude theory, the individual's cognition and evaluation of the practice of entrepreneurship will lead to the adjustment process of desire-result realization, that is, the individual has achieved the planned results. The individual will produce an emotional reaction, then the individual will produce coping responses in an effort to maintain or raise emotional levels. Restated, positive entrepreneurial emotion and negative entrepreneurial emotion may potentially serve as mediators in the relationship between cognitive bias and entrepreneurship intention in entrepreneurship settings. Given the preceding arguments, the study tested the following hypotheses:

Hypothesis 6. Positive entrepreneurial emotion plays a mediating role in the relationship between optimism and entrepreneurship intention.

Hypothesis 7. Negative entrepreneurial emotion plays a mediating role in the relationship between overconfidence and entrepreneurship intention.

RESEARCH METHODS

Study Samples and Procedure

In this study, a total of 350 questionnaires were distributed to college students who participated in entrepreneurship courses at a Chinese university. A total of 38 invalid questionnaires were excluded, due to incomplete answers and social desirability bias. A total of 312 questionnaires were valid, with an effective questionnaire response rate of 89.14%.

Among the participants, 66.70% were men and 33.32% were women; 33.76% were under 20 years of age, 58.01% were 21–23 years old, and 24 years of age or above accounted for 8.36%; engineering majors accounted for 42.38%, science majors accounted for 8.35%, and social sciences majors accounted for 49.43%. With regard to hukou, 47.42% were urban and 52.6% were rural.

Measurement

The main scales in this study were adapted from the English literature. After translating English into Chinese, a professional translated it back into English, and then bilinguals compared the original English version with the translated English version, and then the Chinese version for the survey was formed.

Optimism

The study adapted 10 items from Scheier et al. (1994) optimism scale to develop a measure of optimism using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). In support of construct reliability and validity, the optimism scale has been validated in a prior study for Asian participants, and Cronbach's alpha was 0.87 (Chang et al., 2019). Sample items include "In uncertain circumstances, I usually expect the best results," and "I'm always optimistic about the future."

Overconfidence

The study measured overconfidence using Wilson et al.'s (2007) six-item measure of overconfidence using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale of overconfidence has been validated in prior research for Chinese participants, and Cronbach's alpha was 0.86 (Liao and Zheng, 2017). Sample items include "I have the ability to make decisions," and "I have the ability to solve problems."

Entrepreneurial Emotion

To measure entrepreneurial emotion, the study employed Watson et al.'s (1988) measure of PANAS scales. The PANAS scales have been widely validated in research conducted in China and shows good reliability and validity (Liang and Zhu, 2015; Zhou et al., 2018; Guo et al., 2019). Furthermore, the scale was

applied to the study of entrepreneurial emotions in China. The Cronbach's α values of both positive and negative emotions were >0.6 (He et al., 2017). The study measured positive emotions in six aspects: inspiring, passionate, proud, excited, determined, and active; and measured negative emotions in six aspects: depression, anger, disgust, guilt, nervousness, and fear. A seven-point scale (1 = very weak, 7 = very strong) was used.

Entrepreneurship Intention

The study adapted four items from Phan et al.'s (2002) measure of Singapore students' entrepreneurial propensity to measure entrepreneurship intention using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale of Singapore students' entrepreneurial propensity has been validated in a prior study for Chinese college students, and Cronbach's alpha was 0.80 (Guo et al., 2013). Sample items include "I will take the initiative to understand the detailed process of starting a business," and "I'll start my own business when I get out of school."

Control Variables

Control variables included gender, age, major, and hukou. As previous studies have found that gender and age may affect cognitive bias and entrepreneurial intention (Liao and Zheng, 2017), these variables were added into the model as control variables for empirical analysis.

Data Analysis Method

First, descriptive statistical analysis, reliability analysis, and correlation analysis of the valid sample were performed through SPSS20. Second, using AMOS 25.0 statistical software, confirmed factor analysis and multi-mediation structure equation modeling were analyzed. Since this study includes multiple mediation models, the bootstrapping method was used in the multi-mediation hypothesis test (Preacher and Hayes, 2008). The study used a bias-corrected method for the confidence interval estimation of total, direct, and indirect effects. When the 95% confidence interval for the indirect effect does not include zero, the mediation effects are considered significant (Selvarajan et al., 2013). Compared with the single-mediation variable model, the advantage of the multi-mediation model is that several mediation variables can be incorporated into the structural equation model at the same time, and the relative effect power of each mediation variable can be discussed simultaneously.

RESULTS

The descriptive statistics and correlation coefficients of each variable in this study are shown in **Table 1**.

Reliability and Validity

Confirmatory factor analysis was performed on the following constructs: optimism, overconfidence, positive entrepreneurial emotion, negative entrepreneurial emotion, and entrepreneurship intention. The five-factor model demonstrated a good fit with the data. The various measurement items of constructs were modified from the previous literature. Before the formal survey, the content effect was confirmed by scholars for the questionnaire.

Construct validity includes convergent and discriminant validity. Based on the convergent assessment criteria of Hair et al. (2006), the standardized factor loadings in this study ranged between 0.800 and 0.938, all >0.7; the average variance extracted (AVE) was between 0.785 and 0.870, all >0.5. Moreover, the composite reliability (CR) for each construct was between 0.963 and 0.973, and >0.6. The results show that the scales of this study have convergent validity.

In the assessment criteria for discriminant validity, the mean square root of AVE of each construct should be greater than the correlation coefficient of the constructs, and the number that meets the above criteria must account for 75% of the total (Hair et al., 2006). As shown in **Table 2**, the average square root of construct AVE was between 0.886 and 0.933, which is greater than the correlation coefficient between the constructs. Therefore, constructs in this study have discriminant validity.

This study used the Harman single factor method to detect common method variance (CMV) in accordance with the recommendations by Podsakoff et al. (2003). The results found that five factors explained 86.10% of the total variance. The first factor explained 28.91% of the total variance, which did not exceed 50%, so there is no serious CMV in this study.

Hypothesis Testing

The study tested the overall structural equation model with model fit indexes (Fan et al., 1999; Zhang and Savalei, 2016). The model is ideally fit when χ^2/d is <3. It is recommended that AGFI and GFI should be above 0.90, NFI and CFI should be >0.9 and SRMR should be <0.08. In addition, RMSEA of <0.08 is acceptable.

The model fit indexes of the overall model in this study are as follows: χ^2/d = 1.293, GFI = 0.902, AGFI = 0.885, CFI = 0.990, PGFI = 0.954, NFI = 0.95, RMSEA = 0.031, and SRMR = 0.095, which is slightly >0.08. Overall, the model fit indexes are above the standard values. It indicates that the model fit the sample data well. Therefore, further testing of the study hypothesis is feasible.

The results of the structural equation model analysis are shown in **Table 3**. The results show that optimism has a statistically significant positive impact on entrepreneurship intention. Its path β coefficient value is 0.193 (t = 3.463, p < 0.001); H1a hypothesis is therefore supported. Overconfidence has a statistically significant negative impact on entrepreneurship intention. Its path β coefficient value is −0.148 (t = −2.631, p < 0.01); H1b hypothesis is therefore supported. However, optimism has no significant effect on negative entrepreneurial emotion. Its path β coefficient value is 0.053 (t = 0.922); H2a is therefore not supported. Optimism has a statistically significant positive impact on positive entrepreneurial emotion. Its path β coefficient value is 0.239 (t = 4.217, p < 0.001); H2b hypothesis is therefore supported.

In addition, overconfidence has a statistically significant negative impact on positive entrepreneurial emotion. Its path β coefficient value is −0.128 (t = −2.271, p < 0.05); H3a hypothesis is therefore supported. Overconfidence has a statistically significant positive impact on negative entrepreneurial emotion. Its path β coefficient value is 0.242 (t = 4.212, p < 0.001);

TABLE 1 | Descriptives and correlations.

	Mean	*SD*	1	2	3	4	5	6	7	8	9
1. Gender	1.33	0.472									
2. Age	1.75	0.597	−0.190**								
3. Major	1.66	0.626	−0.007	0.156**							
4. Hukou	1.96	0.207	−0.032	−0.006	−0.048						
5. OP	4.5535	1.57169	−0.014	−0.032	0.003	0.135*					
6. OC	4.5032	1.68006	−0.020	−0.055	0.039	0.114*	0.015				
7. PEE	4.6667	1.64775	0.000	−0.022	0.059	0.129*	0.230**	−0.121*			
8. NEE	4.3745	1.61832	−0.011	−0.021	0.069	0.151**	0.052	0.236**	0.045		
9. EI	3.9439	1.75752	0.038	−0.095	−0.085	0.023	0.211**	−0.217**	0.193**	−0.250**	

*N = 312. OP, Optimism; OC, Overconfidence; PEE, Positive entrepreneurial emotion; NEE, Negative entrepreneurial emotion; EI, Entrepreneurship intention. **p < 0.01, *p < 0.05.*

TABLE 2 | Discriminant validity analysis.

	AVE	OP	OC	PEE	NEE	EI
OP	0.785	**0.886**				
OC	0.855	0.015	**0.925**			
PEE	0.859	0.230**	−0.121*	**0.927**		
NEE	0.812	0.052	0.236**	0.045	**0.901**	
EI	0.870	0.211**	−0.217**	0.193**	−0.250**	**0.933**

*N = 312. AVE, Average Variance Extracted. Diagonal elements (bold) are the square roots of AVE. Off-diagonal elements are correlations between constructs. OP, Optimism; OC, Overconfidence; PEE, Positive entrepreneurial emotion; NEE, Negative entrepreneurial emotion; EI, Entrepreneurship intention. **p < 0.01, *p < 0.05.*

TABLE 3 | Path analysis for the research model.

Path	Path coefficients	T-value	Hypothesis is supported: Yes or No
H1a: Optimism → Entrepreneurship intention	0.193***	3.463	Yes
H1b: Overconfidence → Entrepreneurship intention	−0.148**	−2.631	Yes
H2a: Optimism → Negative entrepreneurial emotion	0.053	0.922	No
H2b: Optimism → Positive entrepreneurial emotion	0.239***	4.217	Yes
H3a: Overconfidence → Positive entrepreneurial emotion	−0.128*	−2.271	Yes
H3b: Overconfidence → Negative entrepreneurial emotion	0.242***	4.212	Yes
H4: Positive entrepreneurial emotion → Entrepreneurship intention	0.146**	2.603	Yes
H5: Negative entrepreneurial emotion → Entrepreneurship intention	−0.244***	−4.330	Yes

*N = 312. ***p < 0.001, **p < 0.01, *p < 0.05.*

H3b hypothesis is therefore supported. Positive entrepreneurial emotion has a statistically significant positive impact on entrepreneurship intention. Its path β coefficient value is 0.146 (t = 2.603, p < 0.01); H4 hypothesis is therefore supported. Negative entrepreneurial emotion has a statistically significant negative impact on entrepreneurship intention. Its path β coefficient value is −0.244 (t = −4.330, p < 0.001); H5 hypothesis is therefore supported.

Moreover, to further explore the mediating effect of entrepreneurial emotion between cognitive bias and entrepreneurship intention, the study used the confidence interval method to estimate the confidence interval for indirect, direct, and total effect. The results of the multiple mediating effect test are shown in **Table 4**.

For the total effect of optimism on entrepreneurship intention, the lower and upper values of bias-corrected 95% CI are 0.102 and 0.325, respectively. They do not include zero, indicating that the total effect is significantly present. The lower and upper values of bias-corrected 95% CI for direct effect are 0.085 and 0.295, respectively, excluding zero, indicating that the direct effect is significantly present. The lower and upper values of bias-corrected 95% CI for indirect effect are 0.010 and 0.076, respectively, excluding zero, indicating that the indirect effect is significantly present. Therefore, positive entrepreneur emotion has a partial mediation effect between optimism and entrepreneurship intention.

For overconfidence's total effect on entrepreneurship intention, the lower and upper values of bias-corrected 95% CI are −0.335 and −0.110, respectively, excluding zero, indicating that the total effect is significant. The lower and upper values of bias-corrected 95% CI for direct effect are −0.260 and −0.034, respectively, excluding zero, indicating that the direct effect is significantly present. The lower and upper values of bias-corrected 95% CI for indirect effect are −0.113 and −0.026,

TABLE 4 | The multiple mediating effect test.

Path			Bootstrapping
	Estimate	*p*-value	Bia-corrected 95% CI
Indirect effect			
H9: Optimism → Positive entrepreneurial emotion n → Entrepreneurship intention	0.035**	0.004	0.010–0.076
H10: Overconfidence → Negative entrepreneurial emotion → Entrepreneurship intention	−0.059***	0.001	−0.113 to −0.026
Direct effect			
Optimism → Entrepreneurship intention	0.193***	0.001	0.085–0.295
Overconfidence → Entrepreneurship intention	−0.148*	0.013	−0.260 to −0.034
Total effect			
Optimism → Entrepreneurship intention	0.215***	0.001	0.102–0.325
Overconfidence → Entrepreneurship intention	−0.226***	0.001	−0.335 to −0.110

*N = 312. Bootstrapping, random sampling 2,000 times. ***p < 0.001, **p < 0.01, *p < 0.05.*

respectively, excluding zero, indicating that the indirect effect is significantly present. Therefore, negative entrepreneurial emotion has a partial mediation effect between overconfidence and entrepreneurship intention.

DISCUSSION

Based on the theory of self-regulating attitude, this study established the conceptual framework of evaluation, emotional reaction, and coping response, and explored the mediation role of entrepreneurial emotion in the relationship between cognitive bias and entrepreneurship intention. This study found that positive entrepreneurial emotion plays a mediating role in the relationship between optimism and entrepreneurship intention. Furthermore, negative entrepreneurial emotion plays a mediating role in the relationship between overconfidence and entrepreneurship intention.

This study found that cognitive factors play an important role in the entrepreneurial process. Entrepreneurship involves a range of behaviors and decision-making processes (Earl, 1996; Shepherd, 2011), and enterprise founders are required to make quick judgments and decisions based on the situation they are facing. Previous studies have shown that founders' decision-making activities are closely related to their cognitive biases (Sadler-Smith, 2016). Cognitive bias can affect individual decision-making and entrepreneurial behavior. Our study found differences between optimism and overconfidence, and they each have different effects on entrepreneurship intention. This is less explored in past empirical studies, whereas Heger and Papageorge (2018) discuss the impact of optimism and overconfidence on wishful thinking.

This study distinguished the two cognitive biases and found that optimism has a statistically significant positive impact on entrepreneurship intention, which is consistent with Dolarslan et al. (2017). Optimism reflects a positive self-judgment about the ability to control the external environment or predict results. Higher optimism means that individuals have confidence in their abilities, which is critical for entrepreneurs when facing uncertain circumstances. It helps founders face potential dilemmas optimistically and actively drive the entrepreneurial process.

In addition, the study found that overconfidence has a statistically significant negative impact on entrepreneurship intention, which is consistent with Dali and Harbi (2016). The results show that prospective entrepreneurs have a relatively contemptuous view of the difficulties and failures in the entrepreneurial process before engaging in actual entrepreneurial activities. Once the environmental conditions change in the process of entrepreneurship, the entrepreneurship may fail, which in turn may lead to a decrease in entrepreneurship intention. Overconfidence reflects that an individual underestimates the risk of entrepreneurship. Higher overconfidence means that a person perceives less risk. Founders perceive a lower potential risk that will lead to the failure of the venture, thereby reducing the willingness to start a business.

The current study also showed that positive entrepreneurial emotion is an important explanatory factor for entrepreneurial behavior tendencies. These findings are in accordance with past research, which suggested that entrepreneurial traits have an important impact on entrepreneurial intention (Shu et al., 2016). This study introduces entrepreneurial emotion into the framework of the relationship between cognition and behavioral intention and expands the research on emotion in the field of entrepreneurship (O'Shea et al., 2017).

Theoretical Implications

This study has some theoretical implications. First, this study found the role of cognitive factors in the process of entrepreneurship and revealed that the two cognitive biases of optimism and overconfidence are the key factors that affect entrepreneurial emotion and entrepreneurial intention. In recent years, Chinese governments at all levels continue to promote various initiatives to encourage college students to start their own businesses. Entrepreneurship education has become a compulsory course for many college students. There are endless successful cases of college students' self-entrepreneurship (Guo et al., 2013). Although there are some differences between college students and social entrepreneurs in demographic characteristics, because college students generally accept entrepreneurship education, and some of them also have practical entrepreneurial experience, it is reasonable to

take college students as the research objects of entrepreneurial theory. In the past, college students were also regarded as the research objects of entrepreneurship theory, such as Guo et al. (2013) and Phan et al. (2002). This study used the research logic of the self-regulating process of evaluation, emotional reaction, and coping response and explored how entrepreneurial cognition has an impact on entrepreneurial intention through entrepreneurial emotion. Therefore, the study has expanded the theoretical research on the role of cognition in entrepreneurship.

Second, this study confirmed the applicability of self-regulating attitude theory in the study of entrepreneurship psychology. Existing literature explored the main factors influencing entrepreneurial choices, such as personal, social, and economic factors (Schmitt-Rodermund and Vondracek, 2002; Cubico et al., 2008). However, there is a lack of a theoretical basis for linking these factors to entrepreneurship intention. Based on the theory of self-regulating attitude, these variables are placed in the theoretical framework of self-regulating attitude, and a theoretical model of cognitive bias, entrepreneurial emotion, and entrepreneurship intention was constructed. This empirical study found that cognitive bias leads to individual emotional responses, which include positive entrepreneurial emotion and negative entrepreneurial emotion. Entrepreneurship intention is the result of the behavioral response after the individual's emotional reaction. This study expands previous research on the relationship between cognitive factors and entrepreneurial behavior and provides a new theoretical basis for the study of entrepreneurship choice.

Moreover, the study focuses on the role of the founder's emotional characteristics in the entrepreneurial process, revealing the mediating role of entrepreneurial emotion in cognitive bias and entrepreneurship intention. The founder's emotion in entrepreneurial activities has attracted increasing attention in recent years (O'Shea et al., 2017). Entrepreneurial activities themselves contain a variety of irrational behavior, especially in the development of entrepreneurial decision-making activities and entrepreneurial passion. Existing studies have focused on the role of emotional characteristics in opportunity cognition, entrepreneurial intention, entrepreneurship self-efficacy, etc. (Kumbanaruk, 2008; Breugst et al., 2012), but ignored emotional characteristics' role in cognitive bias and entrepreneurship intention (Strese et al., 2018). This study empirically analyzed the key role of entrepreneurship emotion in the entrepreneurship intention formation process and contributed to closing the gap of theoretical research on emotional factors in the process of entrepreneurship.

Practical Implications

The results of this study have the following practical implications. First, in the practice of entrepreneurship management, a correct understanding of cognitive bias should be established. Cognitive bias is a cognitive mechanism that causes individuals to make decisions quickly (Dali and Harbi, 2016). Cognitive bias is a double-edged sword (Dolarslan et al., 2017). As far as positive functions are concerned, it enables entrepreneurs to make decisions without too much time and cognitive resources, even in the face of learning new knowledge in a complex environment. However, its negative function will also result in misjudgment of a situation and in decision-making errors, due to less rational decision-making, cognitive blind spots, and the use of limited information. In turn, it may lead to failure to start a business. Therefore, it is necessary for policymakers to pay attention to improve the entrepreneur's cognitive ability. In terms of reducing cognitive bias, college students' entrepreneurs should take practice to identify their own cognitive model, distinguish the difference between optimism and overconfidence, and establish a set of evaluation methods for risk and uncertainty, so as to maintain a positive entrepreneurial emotions and ensure the stimulation and sustainability of entrepreneurial intentions.

Second, in the practice of entrepreneurship management, policymakers should have a clear understanding of entrepreneurial emotion. Positive entrepreneurial emotion is an important entrepreneurial resource, and entrepreneurial emotion may link cognition to entrepreneurial intention and behavior. In the practice of entrepreneurship education and management, organizations and policymakers should have a clear understanding of entrepreneurship emotion, because positive entrepreneurship emotion is an important entrepreneurial resource, and the individual's intention to start a business is closely related to entrepreneurship emotion. In the future, entrepreneurship education and management practice must strengthen the guidance of the individual's positive entrepreneurial emotions and help them identify the positive emotions actively, so as to enhance the entrepreneurial intentions and finally promote the actual entrepreneurial behavior.

Research Limitations and Future Research Recommendations

This paper uses the cross-section research method to collect data. Although the study tested common method bias and the reliability and validity of the related constructs, the causal relationship between these variables is still not completely verified. In the future, researchers should collect longitudinal data through lagging points in time to test the causal relationship among cognitive bias, entrepreneurial emotion, and entrepreneurship intention.

Second, the scales used in this study were mainly from the West, and when these scales are directly referenced in Chinese culture, the scales may not be able to measure the meaning of the concepts. Although the study scales have been back-forward translated, and the study tested their convergence and differentiate validities, follow-up researchers can estimate measurement equivalence of cross-cultural measurement for these scales (Byrne and Watkins, 2003).

Finally, this study's sample came from college students, and in terms of their attributes, the sample was in line with young people's entrepreneurship in most countries. However, this study does not investigate actual enterprise entrepreneurs. Because college students and entrepreneurs have different psychological characteristics, it may lead to different perceptions of entrepreneurship and thus result in different conclusions.

Follow-up studies can expand the generalizability of this study by conducting surveys of entrepreneurs in real business conditions.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* 50, 179–211. doi: 10.1016/0749-5978(91)90020-T

Alessa, A. A. (2019). The relationship between education level, gender, emotion and passion on the fear of failure among entrepreneurs. *SMART J. Bus. Manag. Stud.* 15, 17–27. doi: 10.5958/2321-2012.2019.00011.3

Alos-Ferrer, C., Garagnani, M., and Hugelschafer, S. (2016). Cognitive reflection, decision biases, and response times. *Front. Psychol.* 7:21. doi: 10.3389/fpsyg.2016.01402

Amarakoon, U., Weerawardena, J., Verreynne, M. L., and Teicher, J. (2019). Entrepreneurial behaviour: a new perspective on the role of the hr professional. *Pers. Rev.* 48, 1809–1829. doi: 10.1108/pr-03-2018-0087

Babakus, E., Yavas, U., Karatepe, O., and Avci, T. (2003). The effect of management commitment to service quality on employee affective and performance outcomes. *Official Publ. Acad. Mark. Sci.* 31, 272–286. doi: 10.1177/0092070303031003005

Bagozzi, R. P. (1992). The self-regulation of attitudes, intentions, and behavior. *Soc. Psychol. Q.* 55, 178–204. doi: 10.2307/2786945

Bernoster, I., Rietveld, C. A., Thurik, A. R., and Torres, O. (2018). Overconfidence, optimism and entrepreneurship. *Sustainability* 10:14. doi: 10.3390/su10072233

Bosmans, G., Verhees, M., and De Winter, S. (2019). A further validation of the cognitive bias modification effect on trust in middle childhood. *Behav. Ther.* 50, 1164–1172. doi: 10.1016/j.beth.2019.04.004

Breugst, N., Domurath, A., Patzelt, H., and Klaukien, A. (2012). Perceptions of entrepreneurial passion and employees' commitment to entrepreneurial ventures. *Entrepreneursh. Theor. Pract.* 36, 171–192. doi: 10.1111/j.1540-6520.2011.00491.x

Byrne, B. M., and Watkins, D. (2003). The issue of measurement invariance revisited. *J. Cross-Cult. Psychol.* 34, 155–175. doi: 10.1177/0022022102250225

Byrne, O., and Shepherd, D. A. (2015). Different strokes for different folks: entrepreneurial narratives of emotion, cognition, and making sense of business failure. *Entrep. Theory Pract.* 39, 375–405. doi: 10.1111/etap.12046

Cardon, M. S., Foo, M. D., Shepherd, D., and Wiklund, J. (2012). Exploring the heart: entrepreneurial emotion is a hot topic. *Entrep. Theory Pract.* 36, 1–10. doi: 10.1111/j.1540-6520.2011.00501.x

Chang, E. C., Yi, S., Liu, J., Kamble, S. V., Zhang, Y., Shi, B., et al. (2019). Coping behaviors as predictors of hedonic well-being in asian indians: does being optimistic still make a difference?. *J. Happiness Stud.* 21, 289–304. doi: 10.1007/s10902-019-00087-w

Chaudhary, N. (2018). Cross-cultural psychology as a solution to global inequality: optimism, overconfidence, or naivete? A commentary on "the positive role of culture: what cross-cultural psychology has to offer to developmental aid effectiveness research" by symen a. *Brouwers. J. Cross Cult. Psychol.* 49, 535–544. doi: 10.1177/0022022117740224

Chen, H. M., Tsai, F. S., and Ling, H. C. (2018). Business area changes and entrepreneurial persistence in ecology- and food-related industries: knowledge heterogeneity and emotion perspectives. *Sustainability* 10:10. doi: 10.3390/su10040929

Cubico, S., Bortolani, E., and Favretto, G. (2008). Motivations in entrepreneurial choices: successful and unsuccessful entrepreneurs. *Int. J. Psychol.* 43, 782–782. doi: 10.4324/9781315611495-2

Dali, N., and Harbi, S. (2016). The effect of risk perception and cognitive biases on the evaluation of opportunity in family and non-family entrepreneurs: the case of tunisian entrepreneurs. *J. Enterp. Cult.* 24, 281–312. doi: 10.1142/s0218495816500114

Doern, R., and Goss, D. (2013). From barriers to barring: why emotion matters for entrepreneurial development. *Int. Small Bus. J. Res. Entrep.* 31, 496–519. doi: 10.1177/0266242611425555

Dolarslan, E. S., Kocak, A., and Ozer, A. (2017). Bats are blind?" Cognitive biases in risk perception of entrepreneurs. *J. Dev. Entrep.* 22:13. doi: 10.1142/s1084946717500212

Domeier, M., and Sachse, P. (2016). The logic of cognitive biases in the behavioral decision-making process. *Int. J. Psychol.* 51, 348–349. doi: 10.4018/978-1-5225-2978-1.ch003

Earl, P. (1996). Paradigms and conventions: uncertainty, decision making and entrepreneurship - choi,yb. *J. Econ. Psychol.* 17, 145–148. doi: 10.1016/0167-4870(95)00039-9

Fan, X., Thompson, B., and Wang, L. (1999). Effects of sample size, estimation methods, and model specification on structural equation modeling fit indexes. *Struc. Equ. Model.* 6, 56–83. doi: 10.1080/10705519909540119

Fouquereau, E., Morin, A. J. S., Lapointe, E., Mokounkolo, R., and Gillet, N. (2019). Emotional labour profiles: associations with key predictors and outcomes. *Work Stress* 33, 268–294. doi: 10.1080/02678373.2018.1502835

Giacomin, O., Janssen, F., and Shinnar, R. S. (2016). Student entrepreneurial optimism and overconfidence across cultures. *Int. Small Bus. J. Res. Entrep.* 34, 925–947. doi: 10.1177/0266242616630356

Gorgievski, M. J., Stephan, U., Laguna, M., and Moriano, J. A. (2018). Predicting entrepreneurial career intentions: values and the theory of planned behavior. *J. Career Assess.* 26, 457–475. doi: 10.1177/1069072717714541

Grichnik, D., Smeja, A., and Welpe, I. (2011). The importance of being emotional: how do emotions affect entrepreneurial opportunity evaluation and exploitation? (vol 76, pg 15, 2010). *J. Econ. Behav. Organ.* 80, 680–680. doi: 10.1016/j.jebo.2011.07.001

Guo, Z., Jian'an, Z., and Jinyun, D. (2013). The relationship between entrepreneurial psychological characteristics and entrepreneurial intention of college students: the intermediary effect of coping with employment pressure. *Appl. Psychol.* 19, 265–271. doi: 10.13581/006-60202013-03-0265-07

Guo, Z., Xie, B., Chen, J., and Wang, F. (2019). The Relationship between opportunities for professional development and counterproductive work behaviors: the mediating role of affective well–being and moderating role of task-contingent conscientiousness. *Int. J. Ment. Health Promot.* 21, 111–122. doi: 10.32604/IJMHP.2019.011040

Hahn, A. M., Simons, R. M., Simons, J. S., Wiers, R. W., and Welker, L. E. (2019). Can cognitive bias modification simultaneously target two behaviors? Approach bias retraining for alcohol and condom use. *Clin. Psychol. Sci.* 7, 1078–1093. doi: 10.1177/2167702619834570

Hair, J. Jr., Anderson, R., Tatham, R., and Black, W. (2006). *Multivariate Data Analysis*, 6th Edn. New York, NY: Macmillan.

Hansen, J., and Steinmetz, J. (2019). Motivated level of construal: how temperature affects the construal level of state-relevant stimuli. *Motiv. Emot.* 43, 434–446. doi: 10.1007/s11031-018-09750-w

Hayward, M. L. A., Forster, W. R., Sarasvathy, S. D., and Fredrickson, B. L. (2010). Beyond hubris: how highly confident entrepreneurs rebound to venture again. *J. Bus. Ventur.* 25, 569–578. doi: 10.1016/j.jbusvent.2009.03.002

He, L., Yuli, Z., and Zhenggang, S. (2017). A study on the relationship between entrepreneurial sentiment and entrepreneurial behavior tendency. *Res. Dev. Manag.* 29, 13–20. doi: 10.13581/j.cnki.rdm.2017.03.002

He, V. F., Siren, C., Singh, S., Solomon, G., and von Krogh, G. (2018). Keep calm and carry on: emotion regulation in entrepreneurs' learning from failure. *Entrep. Theory Pract.* 42, 605–630. doi: 10.1111/etap.12273

Heger, S. A., and Papageorge, N. W. (2018). We should totally open a restaurant: how optimism and overconfidence affect beliefs. *J. Econ. Psychol.* 67, 177–190. doi: 10.1016/j.joep.2018.06.006

Hu, R., Mao, Y., and Ye, Y. H. (2017). Learning from entrepreneurial failure: emotions, cognitions, and actions. *Int. Entrep. Manag. J.* 13, 985–988. doi: 10.1007/s11365-017-0442-y

Huxtable-Thomas, L. A., Hannon, P. D., and Thomas, S. W. (2016). An investigation into the role of emotion in leadership development for entrepreneurs a four interface model. *Int. J. Entrep. Behav. Res.* 22, 510–530. doi: 10.1108/ijebr-12-2014-0227

Joo, B. A., and Durri, K. (2017). Influence of overconfidence, optimism and pessimism on the rationality of the individual investors: an empirical analysis. *Pac. Bus. Rev. Int.* 9, 7–13.

Kinari, Y. (2016). Properties of expectation biases: optimism and overconfidence. *J. Behav. Exp. Financ.* 10, 32–49. doi: 10.1016/j.jbef.2016.02.003

Krans, J., Bosmans, G., Salemink, E., and De Raedt, R. (2019). Cognitive bias modification of expectancies (cbm-e): effects on interpretation bias and autobiographical memory, and relations with social and attachment anxiety. *Cogn. Ther. Res.* 43, 1028–1042. doi: 10.1007/s10608-019-10032-z

Kruglanski, A. W., Jasko, K., Chernikova, M., Milyavsky, M., Babush, M., Baldner, C., et al. (2015). The rocky road from attitudes to behaviors: charting the goal systemic course of actions. *Psychol. Rev.* 122, 598–620. doi: 10.1037/a0039541

Kumbanaruk, T. (2008). The relationships between adversity quotient, emotional quotient, business ethics and stress of small and medium entrepreneurs (smes) in bangkok. *Int. J. Psychol.* 43, 538–538. doi: 10.1063/1.5055537

Lazarus, R. S. A. (1991). *Emotion and Adaptation*. New York, NY: Oxford University Press.

Li, J., Chen, X. P., Kotha, S., and Fisher, G. (2017). Catching fire and spreading it: a glimpse into displayed entrepreneurial passion in crowdfunding campaigns. *J. Appl. Psychol.* 102, 1075–1090. doi: 10.1037/apl0000217

Liang, Y., and Zhu, D. (2015). Subjective well-being of Chinese landless peasants in relatively developed regions: measurement using PANAS and SWLS. *Soc. Indic. Res.* 123, 817–835. doi: 10.1007/s11205-014-0762-z

Liao, J., and Zheng, L. (2017). Young heroes: social capital, cognitive biases and entrepreneurial career choice. *J. Scie. Technol. Manag.* 22, 31–67.

Liu, X. Y., Wang, J., and Zhao, C. (2019). An examination of the congruence and incongruence between employee actual and customer perceived emotional labor. *Psychol. Mark.* 36, 863–874. doi: 10.1002/mar.21241

Marchetti, A., Baglio, F., Castelli, I., Griffanti, L., Nemni, R., Rossetto, F., et al. (2019). Social decision making in adolescents and young adults: evidence from the ultimatum game and cognitive biases. *Psychol. Rep.* 122, 135–154. doi: 10.1177/0033294118755673

Neneh, B. N. (2019). From entrepreneurial intentions to behavior: the role of anticipated regret and proactive personality. *J. Vocat. Behav.* 112, 311–324. doi: 10.1016/j.jvb.2019.04.005

Obschonka, M., Moeller, J., and Goethner, M. (2019). Entrepreneurial passion and personality: the case of academic entrepreneurship. *Front. Psychol.* 9:15. doi: 10.3389/fpsyg.2018.02697

Obschonka, M., Silbereisen, R. K., Cantner, U., and Goethner, M. (2015). Entrepreneurial self-identity: predictors and effects within the theory of planned behavior framework. *J. Bus. Psychol.* 30, 773–794. doi: 10.1007/s10869-014-9385-2

Obschonka, M., Silbereisen, R. K., and Schmitt-Rodermund, E. (2012). Explaining entrepreneurial behavior: dispositional personality traits, growth of personal entrepreneurial resources, and business idea generation. *Career Dev. Q.* 60, 178–190. doi: 10.1002/j.2161-0045.2012.00015.x

Onie, S., Gong, S., Manwaring, E., Grageda, D., Webb, K., Yuen, W. S., et al. (2019). Validation of the australian beverage picture set: a controlled picture set for cognitive bias measurement and modification paradigms. *Aust. J. Psychol.* 36, 361–368. doi: 10.1111/ajpy.12272

O'Shea, D., Buckley, F., and Halbesleben, J. (2017). Self-regulation in entrepreneurs: integrating action, cognition, motivation, and emotions. *Organ. Psychol. Rev.* 7, 250–278. doi: 10.1177/2041386617705434

Perez-Lopez, M. C., Gonzalez-Lopez, M. J., and Rodriguez-Ariza, L. (2019). Applying the social cognitive model of career self-management to the entrepreneurial career decision: the role of exploratory and coping adaptive behaviours. *J. Vocat. Behav.* 112, 255–269. doi: 10.1016/j.jvb.2019.03.005

Phan, P. H., Wong, P. K., and Wang, C. K. (2002). Antecedents to entrepreneurship among university students in singapore: beliefs, attitudes and background. *J. Enterpr. Cult.* 10, 151–174. doi: 10.1142/S0218495802000189

Poblete, C., Sena, V., and de Arroyabe, J. C. F. (2019). How do motivational factors influence entrepreneurs' perception of business opportunities in different stages of entrepreneurship? *Eur. J. Work Organ. Psychol.* 28, 179–190. doi: 10.1080/1359432x.2018.1564280

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88:879. doi: 10.1037/0021-9010.88.5.879

Preacher, K., and Hayes, A. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/BRM.40.3.879

Randerson, K., Seaman, C., Daspit, J. J., and Barredy, C. (2020). Institutional influences on entrepreneurial behaviours in the family entrepreneurship context: towards an integrative framework. *Int. J. Entrep. Behav. Res.* 26, 1–13. doi: 10.1108/ijebr-01-2020-824

Ravenelle, A. J. (2019). We're not uber:" Control, autonomy, and entrepreneurship in the gig economy. *J. Manage. Psychol.* 34, 269–285. doi: 10.1108/jmp-06-2018-0256

Rhodes, R. E., Spence, J. C., Berry, T., Deshpande, S., Faulkner, G., Latimer-Cheung, A. E., et al. (2016). Understanding action control of parental support behavior for child physical activity. *Health Psychol.* 35, 131–140. doi: 10.1037/hea0000233

Richards, J., Sang, K., Marks, A., and Gill, S. (2019). "I've found it extremely draining" emotional labour and the lived experience of line managing neurodiversity. *Pers. Rev.* 48, 1903–1923. doi: 10.1108/pr-08-2018-0289

Sadler-Smith, E. (2016). The role of intuition in entrepreneurship and business venturing decisions. *Eur. J. Work Organ. Psychol.* 25, 212–225. doi: 10.1080/1359432x.2015.1029046

Santos, S. C., and Cardon, M. S. (2019). What's love got to do with it? Team entrepreneurial passion and performance in new venture teams. *Entrep. Theory Pract.* 43, 475–504. doi: 10.1177/1042258718812185

Scheier, M. F., Carver, C. S., and Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the life orientation test. *J. Pers. Soc. Psychol.* 67, 1063–1078. doi: 10.1037/0022-3514.67.6.1063

Schmit, M. J., and Allscheid, S. P. (1995). Employee attitudes and customer satisfaction: making theoretical and empirical connections. *Person. Psychol.* 48, 521–536. doi: 10.1111/j.1744-6570.1995.tb01768.x

Schmitt-Rodermund, E., and Vondracek, F. W. (2002). Occupational dreams, choices and aspirations: adolescents' entrepreneurial prospects and orientations. *J. Adolesc.* 25, 65–78. doi: 10.1006/jado.2001.0449

Schneider, B., Godfrey, E. G., Hayes, S. C., Huang, M., Lim, B.-C., Nishii, L. H., et al. (2003). The human side of strategy: employee experiences of strategic alignment in a service organization. *Organ. Dyn.* 32, 122–141. doi: 10.1016/S0090-2616(03)00014-7

Schulte-Holthaus, S. (2019). Passion and performance in entrepreneurial contexts: an interest-based approach. *J. Entrep.* 28, 201–222. doi: 10.1177/0971355719851895

Selvarajan, T. T., Cloninger, P. A., and Singh, B. (2013). Social support and workBh"family conflict: a test of an indirect effects .model. *J. Vocat. Behav.* 83, 486–499. doi: 10.1016/j.jvb.2013.07.004

Shepherd, D. A. (2011). Multilevel entrepreneurship research: opportunities for studying entrepreneurial decision making. *J. Manag.* 37, 412–420. doi: 10.1177/0149206310369940

Shu, D. M., Wu, H. Z., Feng, C. Z., and Jiang, Y. Z. (2016). Entrepreneurial intention among vocational college students and its relationship with big five traits. *Int. J. Psychol.* 51, 912–912. doi: 10.1037/e627722013-357

Strese, S., Keller, M., Flatten, T. C., and Brettel, M. (2018). Ceos' passion for inventing and radical innovations in smes: the moderating effect of shared vision. *J. Small Bus. Manag.* 56, 435–452. doi: 10.1111/jsbm.12264

Trevelyan, R. (2008). Optimism, overconfidence and entrepreneurial activity. *Manag. Decis.* 46, 986–1001. doi: 10.1108/00251740810890177

Wang, W.-T., Lai, W.-Y., and Lu, C.-T. (2019). Learning from others via team conflicts exploring the impact of individual entrepreneurial characteristics on the construction of entrepreneurial identity. *Int. J. Entrep. Behav. Res.* doi: 10.1108/ijebr-10-2018-0667 [Epub ahead of Print].

Watson, D., Clark, L. A., and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the panas scales. *J. Pers. Soc. Psychol.* 54, 1063–1070. doi: 10.1037//0022-3514.54.6.1063

Wilson, F., Kickul, J., and Marlino, D. (2007). Gender, entrepreneurial self–efficacy, and entrepreneurial career intentions: implications for entrepreneurship education. *Entrep. Theory Pract.* 31, 387–406. doi: 10.1111/j.1540-6520.2007.00179.x

Wolfe, M. T., and Shepherd, D. A. (2015). "Bouncing back" from a loss: entrepreneurial orientation, emotions, and failure narratives. *Entrep. Theory Pract.* 39, 675–700. doi: 10.1111/etap.12057

Wu, C., Chen, Y. C., and Meyer, M. R. U. (2020). A moderated mediation model of emotional labor and service performance: examining the role of work-family interface and physically active leisure. *Hum. Perform.* 18,

Zacharakis, A. L., and Shepherd, D. A. (2001). The nature of information and overconfidence on venture capitalists' decision making. *J. Bus. Ventur.* 16, 311–332. doi: 10.1016/S0883-9026(99)00052-X

Zhang, X., and Savalei, V. (2016). Bootstrapping confidence intervals for fit indexes in structural equation modeling. *Struc. Equ. Model.* 23, 392–408. doi: 10.1080/10705511.2015.1118692

Zhou, W., Li, M., Xin, L., and Zhu, J. (2018). The interactive effect of proactive personality and career exploration on graduating students' well-being in school-to-work transition. *Int. J. Ment. Health Promot.* 20, 41–54. doi: 10.32604/IJMPH.2018.010737

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Unveiling the Effectiveness of Agency Cost and Firms' Size as Moderators Between CSR Disclosure and Firms' Growth

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The excellence of corporate governance in companies lies in their ability to adopt the corporate social responsibility (CSR), which enhances their growth. This study examines the effect of agency cost, firm size, and CSR disclosure on the firms' growth. Specifically, the study analyzed the agency cost and firms' size as the moderators that influence the firms' performance asymmetrically. In its approach, the study compiled data of 300 Pakistani listed companies, which have a significant concern with CSR for the period 2010–2018. Using the 2SLS and GMM instrumental panel regressions, our empirical results show that the agency cost is detrimental to the firms' growth. In contrast, the firms' size boosts the firms' growth. Moreover, the growth of firms with leverage declines and the presence of independent directors improves the firms' growth.

Keywords: corporate social responsibility, agency cost, firm size, firm growth, Pakistani companies

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INTRODUCTION

The extant literature enunciates how corporate governance is significant for all companies (Daily et al., 2002; Gabrielsson, 2017). The corporate governance concept basically entails leading or guiding (Abdullah and Benedict, 2009). With corporate governance, all types of firms, including novel entrepreneurs to whom corporate governance is inevitable, can confront the challenging business environment. Many theories (agency, resource dependence, stewardship, transaction cost, stakeholder, and political theories) explore the efficiency of corporate governance and negative aspects that can be detrimental to the corporate governance. Stewardship, stakeholder, and resource-based theories enunciate the role of managers and executives when working with the stakeholders, thus enhancing the growth of the firm. The transaction cost and agency theories—detrimental to a firm's growth—are, however, beneficial to the top executives. Political theory highlights the pros and cons of political links within and outside the organization. According to Zattoni, the research on corporate governance has been conducted under the umbrella of the agency theory, which considers the economic factor to highlight the effectiveness of the corporate governance (Zattoni et al., 2013). The theory of corporate governance also suggests that the interests of minority shareholders should be considered (by mitigating the agency cost; Chen et al., 2019).

Corporate governance acts as vanguard to the firms' performance (Adams et al., 2010; Bhagat and Bolton, 2019). Since the inception of globalization, products have become an integral part of human life globally. However, societies are faced with changes in organizations and environmental pollution; thus, firms are recommended to adopt corporate social responsibility (CSR)

measures to alleviate these concerns. Meanwhile, to confront the dynamic environment of business, organizations are oriented toward innovative activities. These innovative activities, however, should be aligned with the CSR. Some studies posit that high-performing firms always adopt CSR measures, whereas low-performing ones are less likely to adopt these measures. Large firms perform well generally. However, the firm size as a moderator of firm growth has not been explored comprehensively.

Owing to a dynamic business environment, many developed and developing countries are transitioning to industrialization, which eventually pollutes the environment. On the one hand, developed countries adopt CSR measures to alleviate the environmental problems. Environmental and corporate governance activities affect the performance of businesses (Xie et al., 2019). Large firms are oriented toward the CSR; they are also donating their funds to charities. Through this contribution, firms are working for the benefit of the society. Disclosing CSR measures boosts performance of firms (Akben-Selcuk, 2019). On the other hand, some developing countries orient their governmental institutions to adopt CSR measures[1] in order to meet the international standards of organizational structures (Saeidi et al., 2015).

Being an emerging economy, Pakistan is suffering from severe economic decline (Javeed and Lefen, 2019). Moreover, Pakistani firms are confronting the problems of low-quality manufacturing products, inadequate infrastructure for living and lack of laborers' law. Meanwhile, due to mismanagement of wastage material among Pakistani firms, there is continuous threat of pollution and environmental issue (Ehsan et al., 2018). In a Pakistani perspective, it has been witnessed that matured firms endorse CSR activity as compared to small firms (Waheed, 2005). Significantly, SECP (security exchange commission of Pakistan) had introduced the CSR disclosure measure in 2009, which is also quite novel (Javeed and Lefen, 2019). Moreover, the intervention of government among Pakistani SOEs[2] is also doubtful due to their sluggish performance (Bhat et al., 2018). Henceforth, in such circumstances, it is quite interesting to analyze the effectiveness of CSR on Pakistani firms under the influence of the specific moderators.

Comprehensively, CSR activity agitates the problem caused by spending extra funds by the upper echelon (McGuinness et al., 2017). Thus, it would also be worthwhile to contemplate the impact of the CSR disclosure on firms' performance under the moderating influence of firm size. More specifically, it is quite significant to analyze the effectiveness of agency cost as a moderator between CSR disclosure and firms' growth. Arguably, being an emerging country, Pakistani firms have been suffering from agency cost problem, which is why this study will contemplate whether the agency cost problem exacerbates the firms' performance or not under the adaptation of CSR measures.

[1] According to Saeidi et al. (2015), although CSR influences the firms' performance directly, this direct effect is based on some indirect influence of other factors such as competitive advantage, reputation, and customer satisfaction.

[2] Pakistani Airlines is struggling due to poor governance (Bhat et al., 2018).

The remnant of the paper proceeds as follows. *Section "Literature review and hypothesis formulation"* describes the literature review and hypotheses formulation. *Section "Data and variable measures"* illustrates the data accumulation and variable measures along with empirical models. *Section "Empirical results"* illustrates the empirical results. *Section "Empirical Results of GMM instrumental Regression"* signifies the results of GMM instrumental regression. *Section "Discussion and Conclusion"* elucidates the conclusion and practical implications.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Argumentatively, it is the prime responsibility of the organization to take care of society and actively participate in such activities that are beneficial for the society. In this regard, legitimate theory emphasizes on the aspect that an organization should disclose its information about CSR to the public and also execute such strategies that are conducive for environment. Further, in the context of social reporting, the legitimacy theory seems to be widely applicable (Fernando and Lawrence, 2014). Meanwhile, some other aspect of the legitimacy theory emphasizes on the dynamic phenomenon that divulges the corporate objectives under the influence of public desire while confronting the societal expectations (Deegan et al., 2002). Hence, it is essential for the firms to be responsible for securing its surroundings, which can be achieved via adopting CSR. Adopting CSR can be costly, and its advantage may not be apparent; hence, stakeholders are not entirely satisfied with the measures (Gul et al., 2020). Some studies showed how CSR disclosure is measured. According to Gatti and Seele, European reports are more focused on the employees' issues, while American reports are not (Gatti and Seele, 2014). Although different terminologies are coined for CSR, there is no clarification what it really means. Among others, these terminologies include "sustainable development," "corporate citizenship," "sustainable entrepreneurship," "Triple Bottom Line," "business ethics," and CSR. Sharif and Rashid suggested that corporate governance influences the CSR (Sharif and Rashid, 2014). They have examined the role of non-executive directors and found that they influence the CSR reporting of banks positively. Furthermore, they enunciated that corporate governance plays a pivotal role in boosting the CSR disclosure activity. They have encapsulated that CSR activity is the indicator of the firms' economic conditions (firms' market position, size, industry relationship, risk management, market response, micro and macro environmental impact, and companies' good will). Even more, they clarified that upper echelon work for the beneficiary of stakeholders.

Other studies suggest that CEO ownership negatively influences the CSR activities (Elgergeni et al., 2018). They have formulated voluntary CSR by considering its different aspects. Gender difference has also been analyzed to demonstrate its effect on CSR. They have mentioned that CSR activity is conducive for the company's internal and external mechanisms. More precisely, CSR in companies not only enhances the revenue through its good reputation, but also mitigates the risk through nourishing

the relation with customers. The studies further suggested that women are more oriented toward ethical issues as compared to men (Simionescu, 2015). A diverse board reassures stakeholders that the organization is capable to deal with social responsibilities. Moreover, an external director ownership is linked to improved CSR activities (Oh et al., 2019).

Corporate social responsibility can be regarded as a vehicle for enhancing the firms' performance. In this regard, many studies have witnessed that CSR affects the performance asymmetrically (Broadstock et al., 2019). Meanwhile, it should be emphasized that CSR is also beneficial for firms' growth.

However, the effect of CSR on firms' performance is still subject to an in-depth study that considers the agency cost and firms' size. This leads us to the first hypothesis.

H1: CSR disclosure positively influences the firm performance.

Existing studies already indicated that CSR enhances the firms' performance (Su and Sauerwald, 2018), suggesting a positive relationship between CSR and firms' growth. Moreover, the studies suggested that firms' size has a positive relation with the firms' growth (Shaukat et al., 2016). Meanwhile, it has also been demonstrated that board independence and gender diversity are necessary for escalating the growth and CSR activity. Further, scholars have witnessed that corporate governance plays the role of a moderator when improving the CSR activities (Su and Sauerwald, 2018). In a recent study, Tulung and Ramdani (2018) have examined the positive relation between firms' size and performance of a board. Other studies suggest that firm's size boost innovative performance of the firms (Jugend et al., 2018). Similarly, Yook et al. (2018) have demonstrated the firms' size as moderator while influencing the environmental issue but neglected CSR disclosure and CSR performance which can affect the firms' performance. The firms' size plays a significant role in boosting the firms' growth. It also boosts the CSR performance by ameliorating the sustainability reporting (Schreck and Raithel, 2018). Therefore, it can be conjectured that the firms' size can act as a moderator between the CSR and performance while boosting the firms' growth.

H2: Firm size as a moderator positively influences the firms' performance via CSR activity.

Intuitively, pragmatic legitimacy theory enunciates that it is the responsibility of the firms to disclose the CSR. Meanwhile influential legitimacy emphasizes on the interests of stakeholders (Clarkson, 1995). Hence, it can be encapsulated that influential legitimacy theory suggests to alleviate the agency problem while providing benefits to the stakeholders. Categorically, the effective corporate mechanism always endeavors to mitigate the principal agent problem. Agency cost problem always emerges whenever the target of principal and agent is not congruent. The extant literature has witnessed that agency cost problem is reduced by adopting CSR activities (Li et al., 2017), which will eventually improve performance. In a recent study, it has been demonstrated that CSR disclosure and agency cost are not related (Zhou et al., 2018). Meanwhile the firms' performance has a positive impact on the CSR (Erhemjamts et al., 2013), while agency cost mitigates the firms' growth (Anderson et al., 2018). Comprehensively, CSR activity agitates the problem that is caused by spending extra funds by the upper echelon (McGuinness et al., 2017). Thus, it would also be worthwhile to contemplate the impact of the CSR activity on firms' performance under the influence of agency cost problem. The extent literature has witnessed that agency cost problem is reduced by adopting CSR activities (Li et al., 2020), which ultimately escalates the performance. In a recent study, it has been demonstrated that CSR disclosure and agency cost has a negative relation (Chen et al., 2019). Meanwhile the firms' performance has a positive impact on the CSR. Hence, it can be assessed that the result should be negative whether agency cost acts as a moderator between performance and CSR. In this regard, we can formulate our hypothesis.

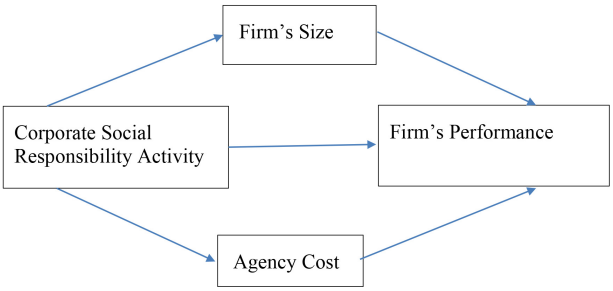

FIGURE 1 | The theoretical model of research.

H3: Agency cost as a moderator will mitigate the performance in the presence of CSR activity.

On the basis of previous discussion, this study intends to explore the CSR role on firm performance with the moderating effects of firm size and agency cost as shown in **Figure 1**.

DATA AND VARIABLE MEASURES

We have collected data of the firms listed on the Karachi Stock Exchange (KSE) for the period 2010–2018, Among 553 firms listed on the KSE, 300 selected firms have been witnessed to be highly concerned with CSR activity. The mathematical expression below indicates CSR disclosure. See specific attributes in section "**Appendix**".

$$CSRD_{i,t} = \sum X_{it} \Big/ n \text{ where } n \in Z^{+} \quad (1)$$

Equation (1) illustrates CSR disclosure as the sum of all attributes. Further, in this equation, "X_{it}" indicates the total number of attributes.

For empirical analysis, we have endorsed the control variables and independent variables such as "LnTA" (total assets), "EPS" (earnings per share), "Leverage," "SOE" (state-owned enterprises), and number of independent directors (Chen et al., 2019; Sarfraz et al., 2019; Shah et al., 2019b). "EPS" and "lnTA" capture the firms' performance (Li et al., 2020; Sarfraz

et al., 2020). Additionally, "leverage" signifies the economic condition of the firm, whereas independent directors always monitor sustainability of the firm's growth. Meanwhile, "ROA" and "ROE" have been endorsed as proxies for measuring the firm performance.

Empirical Models

To demonstrate the impact of CSR on firms' growth via agency cost and firm size, we used the panel regression technique. The threat of endogeneity has been eradicated through 2SLS instrumental regression. Some scholars suggest interpreting the results of 2SLS instrumental regression directly (Larcker and Rusticus, 2010; Shah et al., 2019a; Sarfraz et al., forthcoming). Therefore, we show only the results of 2SLS regression. "Normative CSR disclosure" has been endorsed as an instrumental variable. The empirical models are expressed as follows:

$$FP_{it} = \gamma_0 + \gamma_{1it}\left(CSRD^{*}_{it} AgencyCost_{it}\right) + \gamma_{2it} SOE_{it} + \gamma_{3it} INDDIR_{it} + \gamma_{4it} FS_{it} + \gamma_{5it} ln\, TA_{it} + \gamma_{6it} Leverage_{it} + \gamma_{7it} EPS_{it} + \tau Industry\ dummy + \mu\, Year\ dummy\ + \varepsilon_{it} \quad (2)$$

$$FP_{it} = \gamma_0 + \gamma_{1it}(CSRR^{*}_{it} FS_{it}) + \gamma_{2it} SOE_{it} + \gamma_{3it} INDDIR_{it} + \gamma_{4it} lnTA_{it} + \gamma_{5it} Leverage_{it} + \gamma_{6it} EPS_{it} + \tau Industry\ dummy + \mu\, Year\ dummy + \varepsilon_{it} \quad (3)$$

$$FP_{it} = \gamma_0 + \gamma_{1it} CSRD_{it} + \gamma_{2it} SOE_{it} + \gamma_{3it} INDDIR_{it} + \gamma_{4it} FS_{it} + \gamma_{5it} lnTA_{it} + \gamma_{6it} Leverage_{it} + \gamma_{7it} EPS_{it} + \tau Industry\ dummy + \mu\, Year\ dummy + \varepsilon_{it} \quad (4)$$

In Eqs (2, 3), the dependent variable is firms' performance, indicated by "FP_{it}." The variables "FS_{it}" and "$INDDIR_{it}$" are firm size and number of independent directors, respectively. Meanwhile, the moderators have been represented by the interaction terms "$CSRD_{it}$*$AgencyCost_{it}$" and "$CSRR_{it}$*FS_{it}," respectively. Moreover, Eq. (4) represents the panel regression for analyzing the effectiveness of CSR disclosure on firms' performance. The variables "$\tau Industry\ dummy + \mu\, Year\ dummy$" represents the industry dummy and year dummy.

EMPIRICAL RESULTS

Firstly, fixed effect panel regression has been confirmed with the Hausman test. Additionally, lagged variable regression has been executed while confirming the presence of an endogeneity problem. However, we have represented the authentic 2SLS instrumental regression results. **Table 1** illustrates the descriptive statistics. All the variables but the agency cost (due to some missing data, the number of observations is 2286) were equally observed. Agency cost has been measured through the proxy asset utilization ratio. The asset utilization ratio is determined as annual sales/total assets.

Table 1 illustrates the descriptive statistics. Agency cost has the maximum standard deviation. The minimum value of the agency cost is "0" and maximum value is 350.1522, with a mean value of 6.539559. Thus, its volatility is high compared to remaining variables, but it is acceptable for empirical analysis.

Table 2 indicates the correlation matrix, which reveals that regression can be run without any threat of multicollinearity. The maximum correlation value is "0.3594" between LNEMP and LNTA.

In **Table 2**, the maximum correlation value "0.3594" is acceptable for empirical analysis. All other variables have less correlation values, which shows that there is no threat of absolute multicollinearity among all variables.

Table 3 shows 2SLS regression results. CSR disclosure has enhanced the firms' growth (first row of **Table 3**). Conversely, firm size has reduced the firms' growth (fifth row of **Table 3**), because a large number of employees can impede the firms' growth. Meanwhile, the numbers of independent directors have boosted the CSR activity, because the external directors can compel the top executives to disclose the CSR, thus improving the firms' performance.

Table 3 indicates that CSR disclosure is positively significant for ROA and ROE. The coefficient values of CSRD are "2.269*" and "3.830*," respectively. Further, the variable "LNEMP" is negatively significant for ROA and ROE ("−0.0298**" and "−0.0418**," respectively). Reciprocally, the variable "INDDIR" is positively significant for both ROA and ROE ("0.0966*" and "0.0842*," respectively).

Table 4 shows that firms with a large number of employees can boost growth by disclosing the CSR. Moreover, the role of independent directors is highly appreciable through their vigilant strategies (as NIND is positively significant).

Table 4 indicates that the interaction term of CSRD and firms' size (CSRD*FS) is positively significant for both ROA and ROE ("0.353*" and "0.489*," respectively). Meanwhile, INDDIR is also positively significant for firms' growth ("0.0951*" and "0.0715*," respectively).

Table 5 shows the role of the agency cost as the moderator. It shows that the agency cost reduces the firms' growth (first row of **Table 5**), because it disregards CSR disclosure and performance. As a result, it affects the firms' growth and image adversely. Furthermore, leverage shows negative significance, which also threatens the firms' performance, because investors are easily discouraged by existing heavy loans.

In **Table 5**, the moderator agency cost has negatively affected ROA and ROE. The first row of **Table 5** indicates that the coefficient values for the interaction term (CSRD*AGC) are "−0.0567***" and "−0.0645**," respectively. Similarly, the variable "leverage" is also negatively significant for firms' performance. The coefficient values of the variable "leverage" are "−0.424***" and "−0.0569*" (third row of **Table 5**), respectively.

TABLE 1 | Descriptive statistics.

Variables	Obs	Mean	Std. Dev	Min	Max
CSRD	2400	0.6140385	0.1195372	0.2307692	0.9230769
EPS	2396	0.3372983	1.13133	−3.859921	42.43205
ROA	2399	0.298656	0.2483674	−2.776046	8.441391
ROE	2366	0.2717825	0.5928742	−0.645726	9.392855
LNTA	2397	22.29809	1.477981	15.97917	30.60502
LNEMP	2398	7.793752	1.420357	1.609438	13.12851
Agency cost	2286	6.539559	5.15853	0	350.1522
Leverage	2399	0.4916175	0.3290587	0.007969	8.611787
SOE	2400	0.4504167	0.4976391	0	1
INDDIR	2400	7.960417	0.995121	4	13

TABLE 2 | Correlation matrix.

Variables	CSRD	EPS	ROA	LNTA	LNEMP	SOE	Agency cost	INDDIR	Leverage	ROE
CSRD	1.000									
EPS	−0.0055	1.000								
ROA	−0.0027	0.2181	1.000							
LNTA	−0.0292	0.1497	−0.0187	1.000						
LNEMP	0.0561	0.0727	0.0005	0.3594	1.000					
SOE	−0.1079	0.0014	−0.0208	0.1646	0.1104	1.000				
Agency cost	0.0157	0.0080	0.0110	−0.0452	−0.0603	−0.0449	1.000			
INDDIR	0.0094	0.0129	−0.0218	0.2898	0.3551	0.1075	−0.0407	1.000		
Leverage	−0.0571	−0.1064	−0.3566	0.1757	0.0539	0.1023	−0.0446	0.0719	1.000	
ROE	0.0162	−0.0103	0.0142	−0.0214	−0.0239	0.0038	0.0253	−0.0304	−0.0034	1.000

The remaining variables LNTA (logarithm of total assets), EPS (earnings per share), SOE (state owned enterprises), and INDDIR (independent directors) are insignificant.

EMPIRICAL RESULTS OF GMM INSTRUMENTAL REGRESSION

In this section, we have executed the GMM instrumental regression. The objective of executing the GMM instrumental regression is to confirm that our results are authenticated and reliable to be interpreted for implications. **Table 6** evaluates the impact of CSR disclosure, which positively boosts the performance. **Table 6** elaborates that results are the same (**Table 3**). Additionally, the variable "LNEMP" has indicated the negative significance.

Table 6 indicates that CSRD is positively significant for performance. Significantly, the first row of **Table 6** indicates the coefficient values of CSRD (2.125* and 2.398*, respectively). Additionally, the variable "LNEMP" is negatively significant, whose coefficients values are "−0.0251*" and "−0.0299**," respectively. However, the remaining variables have shown insignificant results.

Table 7 has shown that the firms' size as a moderator has positively boosted the firms' performance (as indicated by the first row). Moreover, the leverage has shown negative significance.

Table 7 has indicated that the moderator (firms' size) positively boosts the performance. The first row of **Table 7** indicates the coefficient values of the interaction term (CSR*FSZ), which are "0.320**" and "3.889*," respectively, Additionally, leverage has shown negative significance, whose coefficient values are "−0.294*" and "−0.571*," respectively. Meanwhile, the remnant variables "EPS," "SOE," "INDDIR," and "LNTA" are insignificant.

Table 8 indicates that agency cost is negatively significant for the firms' performance. Suggestively, the results indicate that agency cost is even detrimental for firms' performance whether a firm discloses the CSR. Moreover, firms having high foreign loan burden is detrimental for the firms' growth. Reasonably, a firm that is suffering from loan burden cannot pay attention toward CSR activity. Meanwhile, agency cost exacerbates the already miserable plight that destroys the firms' performance vehemently.

Table 8 has shown that agency cost as a moderator is negatively significant for firms' performance (first row of **Table 8**). Additionally, leverage is negatively significant.

DISCUSSION AND CONCLUSION

Discussion

According to the corporate governance country assessment report launched by the World Bank in 2018, Pakistani firms are ameliorating its corporate governance structure. At the initial stage during 2001–2002, severe resistance among corporate organizations was observed, which later on accepted that

TABLE 3 | 2SLS Instrumental regression for CSR disclosure and firms' performance.

Variables	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROE	ROE
CSRD	2.269*	2.269*	2.260*	3.830*	3.838*
	(1.438)	(1.433)	(1.438)	(1.833)	(1.832)
EPS	−0.00124	−0.00115	−0.00141	−0.00231	−0.00216
	(0.0124)	(0.0124)	(0.0124)	(0.0162)	(0.0162)
Leverage	0.0381	0.0370	0.0379	0.0261	0.0263
	(0.0477)	(0.0480)	(0.0477)	(0.0508)	(0.0508)
LNTA	−0.000597	−0.00222	−0.000521	−0.00175	−0.00182
	(0.0107)	(0.0108)	(0.0107)	(0.0114)	(0.0114)
LNEMP	−0.0298**	−0.0301**	−0.0299**	−0.0418**	−0.0417**
	(0.0151)	(0.0152)	(0.0151)	(0.0161)	(0.0161)
SOE	0.0658	0.0696	0.0651	0.1769	0.1775
	(0.0426)	(0.0435)	(0.0426)	(0.0454)	(0.0454)
INDDIR	0.0966*	0.107*			0.0842*
	(0.0110)	(0.0114)			(0.0117)
Industry $_{Dummy}$	YES	YES	YES	YES	YES
Year $_{Dummy}$	YES	YES	YES	YES	YES
Constant	−1.146	−1.109	−1.104	−1.923	−1.960
	(0.903)	(0.895)	(0.907)	(0.967)	(0.962)
Observations	2,357	2,308	2,357	2,357	2,357
R-squared	0.389	0.376	0.389	0.276	0.276

*Standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

TABLE 4 | 2SLS Instrumental regression for moderator firms' size.

Variables	(1)	(2)	(3)	(4)
	ROA	ROA	ROE	ROE
CSRD*FS	0.353*	0.352*	0.489*	0.489*
	(0.201)	(0.201)	(0.275)	(0.275)
EPS	−0.00106	−0.00121	−0.00197	−0.00209
	(0.0126)	(0.0126)	(0.0135)	(0.0135)
Leverage	0.0364	0.0362	0.0244	0.0242
	(0.0482)	(0.0482)	(0.0514)	(0.0514)
LNTA	−0.00370	−0.00362	−0.00524	−0.00517
	(0.0107)	(0.0106)	(0.0114)	(0.0114)
SOE	0.0644	0.0638	0.0760	0.0755
	(0.0428)	(0.0429)	(0.0477)	(0.0478)
INDDIR	0.0951*		0.0715*	
	(0.0113)		(0.0101)	
Industry $_{Dummy}$	YES	YES	YES	YES
Year $_{Dummy}$	YES	YES	YES	YES
Constant	0.462**	0.494**	0.516**	0.543**
	(0.224)	(0.219)	(0.239)	(0.234)
Observations	2,357	2,357	2,357	2,357
R-squared	0.386	0.386	0.273	0.273

*Standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

TABLE 5 | 2SLS Instrumental regression for the moderator agency cost.

Variables	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROA	ROE	ROE
CSRD*AGC	−0.0567***	−0.0584***	−0.0581**	−0.0645**	−0.0642**
	(0.0431)	(0.0391)	(0.0390)	(0.0421)	(0.0420)
EPS	0.00145	0.00151	0.00140	0.000861	0.000766
	(0.0158)	(0.0154)	(0.0154)	(0.0166)	(0.0165)
Leverage	−0.424***	−0.0463***	−0.0460***	−0.0569*	−0.0566*
	(0.0615)	(0.0603)	(0.0601)	(0.0699)	(0.0698)
LNTA		−0.0219	−0.0218	−0.0350	−0.0349
		(0.0151)	(0.0150)	(0.0162)	(0.0162)
SOE		−0.0331	−0.0331	−0.0421	−0.0421
		(0.0447)	(0.0446)	(0.0481)	(0.0480)
INDDIR	0.00575	0.00564		0.00481	
	(0.00753)	(0.0136)		(0.0147)	
Industry $_{Dummy}$	YES	YES	YES	YES	YES
Industry $_{Dummy}$	YES	YES	YES	YES	YES
Constant	−0.815*	0.861**	0.879**	0.956**	0.971**
	(0.389)	(0.387)	(0.386)	(0.417)	(0.415)
Observations	2,245	2,245	2,245	2,245	2,245
R-squared	0.326	0.347	0.326	0.258	0.258

*Standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

TABLE 6 | GMM for Corporate social responsibility disclosure and firm's performance.

Variables	(1)	(2)	(3)	(4)
	ROA	ROA	ROE	ROE
CSRD	2.125*	2.116*	2.398*	2.560*
	(1.502)	(1.498)	(1.374)	(1.413)
EPS	0.0418	0.0418	−0.00192	−0.00141
	(0.0295)	(0.0295)	(0.00971)	(0.0100)
Leverage	−0.224	−0.224	0.0365	0.0379
	(0.156)	(0.156)	(0.0368)	(0.0377)
LNTA	0.00645	0.00624	0.000844	−0.000521
	(0.0130)	(0.0131)	(0.0103)	(0.0102)
LNEMP	−0.0251*	−0.0253*	−0.0258*	−0.0299**
	(0.0102)	(0.0102)	(0.0138)	(0.0139)
SOE	0.0552	0.0549	0.0630*	0.0651*
	(0.0620)	(0.0618)	(0.0374)	(0.0383)
INDDIR	−0.000809		−0.00737	
	(0.00316)		(0.00706)	
Industry $_{Dummy}$	YES	YES	YES	YES
Year $_{Dummy}$	YES	YES	YES	YES
Constant	−1.224	−1.218	−0.999	−1.104
	(1.593)	(1.592)	(0.872)	(0.898)
Observations	2,380	2,380	2,357	2,357
R-squared	0.298	0.298	0.210	0.210

*Standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

corporate governance codes not only are significant but also proved to be conducive for these organizations. It has been observed that multinationals, renowned banks, and specifically family controlled firms have ameliorated their corporate structure via promulgating translucent corporate governance mechanism. In this regard, the current study signifies the role of

TABLE 7 | GMM for firms' size as a moderator.

Variables	(1)	(2)	(3)	(4)
	ROA	ROA	ROE	ROE
CSR*FSZ	0.320**	2.376**	0.907*	3.889*
	(0.187)	(1.36)	(0.397)	(2.56)
EPS	0.0444	0.0213	−0.0157	0.0484
	(0.0312)	(0.141)	(0.0244)	(0.343)
LEV	−0.294*	−0.00731	−0.0943*	−0.571*
	(0.171)	(1.694)	(0.015)	(0.380)
LNTA	0.0552	−0.506	−0.138	1.230
	(0.0646)	(3.497)	(0.132)	(7.270)
SOE	−0.0221	0.139	0.0792	−0.305
	(0.0343)	(0.922)	(0.0842)	(1.840)
INDDIR	0.0423		−0.115	
	(0.0518)		(0.106)	
Industry $_{Dummy}$	YES	YES	YES	YES
Year $_{Dummy}$	YES	YES	YES	YES
Constant	0.0955	−0.162	0.415	1.540
	(0.203)	(1.974)	(0.382)	(6.812)
Observations	2,391	2,391	2,357	2,357
R-squared	0.263	0.263	0.196	0.196

*Robust standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

TABLE 8 | GMM for agency cost as a moderator.

Variables	(1)	(2)	(3)	(4)
	ROA	ROA	ROE	ROE
*CSR*AGC*	*−0.0608***	*−0.0612***	*−0.105**	*−0.113**
	(0.0148)	*(0.0165)*	*(0.0069)*	*(0.0053)*
EPS	0.0415	0.0417	0.00525	0.00716
	(0.0327)	(0.0331)	(0.0129)	(0.0140)
LEV	−0.271*	−0.271*	−0.0807	−0.0896
	(0.144)	(0.144)	(0.0900)	(0.0958)
LNTA	−8.80e − 05	−0.000598	−0.0147	−0.0208
	(0.0248)	(0.0268)	(0.0212)	(0.0238)
LNEMP	−0.00287	−0.00367	−0.0285	−0.0396
	(0.0183)	(0.0215)	(0.0315)	(0.0368)
SOE	−0.00345	−0.00410	−0.0561	−0.0657
	(0.0479)	(0.0505)	(0.0653)	(0.0703)
INDDIR	−0.00165		−0.0225	
	(0.00685)		(0.0165)	
Industry $_{Dummy}$	YES	YES	YES	YES
Year $_{Dummy}$	YES	YES	YES	YES
Constant	0.207	0.211	1.239	1.280
	(0.860)	(0.877)	(0.814)	(0.838)
Observations	2,277	2,277	2,243	2,243
R-squared	0.267	0.267	0.219	0.219

*Robust standard errors in parentheses ***p < 0.01, **p < 0.05, and *p < 0.1.*

corporate social responsible activity under the patronage of novel corporate governance, which influences the firms' growth.

Empirical results have evaluated that CSR disclosure boosts the firms' performance (Malik and Kanwal, 2018), suggesting that disclosing such activity not only boosts the performance but also allures the investors for being a philanthropist. Meanwhile, agency cost as a moderator has been signified as a detrimental vehicle for firms' growth (Abdullah et al., 2012). Under the aegis of influential legitimacy theory, our results have been justified while suggesting to mitigate the agency cost problem; otherwise, CSR disclosure is useless. Moreover, the firms' size as a moderator has boosted the firms' performance (Tulung and Ramdani, 2018) while concluding that firms having a large number of employees have an extra opportunity to allocate their employees to concentrate on the corporate social responsible activities that is beneficial for the firms' growth.

Conclusion

Pakistan being an emerging economic and a vibrant member of CPEC, it is quite significant to contemplate Pakistani firms while confronting the devastated economy for the last 10 years. Pakistani firms have been compelled to adopt CSR activities, which makes it worthwhile to contemplate these firms due to the following reasons. Firstly, the Security Exchange Commission of Pakistan had promulgated the ordinance in 2009 to adopt CSR measures for the listed companies. Secondly, in 2017, the global climax index listed Pakistan as the seventh most vulnerable country confronting the climate change (Eckstein et al., 2016). Thirdly, being a member of CPEC countries, it would be interesting that Pakistan's economy need to be escalated without disturbing the environment (Ikram et al., 2019). In this regard, the current study has elucidated the effectiveness of CSR disclosure on the firms' performance under the aegis of agency cost and firms' size.

We showed that CSR disclosure enhances the firms' growth because investors are impressed by a firm's involvement in corporate social responsibilities. Willingness to engage in CSR indicates the efficiency of the corporate governance. Furthermore, we found that the agency cost impedes the firms' growth because it repels investors, who might end up diverting their investments elsewhere. Conversely, the firms' size improves the firms' growth because a firm can easily allocate its many employees to R&D and CSR activities, thus improving the performance. Generally, large firms are mature, with specific goals for growth. Such firms are more likely to adopt CSR activities, which will ultimately boost their growth. We also found that high leverage reduces the firms' growth and independent directors boost the firms' growth.

Through contemplation of this study, certain recommendations have been deduced for academicians, organizational scholars, and practitioners. Suggestively, the trend of CSR is conducive for the prosperity of the organizations, but specific steps are required to invigorate the intensity of this prosperity. Convincingly, firms should curtail the agency cost problem decisively, which not only tarnishes the images of the firms but also destroys its performance vehemently. Agency cost problem indicates that firms' corporate governance mechanism is fragile, which ultimately allows the upper echelon to confiscate the rights of minority shareholders. Meanwhile, due to agency cost problem, firms spoil the funds, which is why the research and development department is neglected. Therefore, the firms'

prime priority is to eradicate the agency cost problem (either type 1 or type 2).

The study has practical implications for practitioners and academic scholars. First, the study recommends mitigating the agency cost problem because it may render CSR disclosure worthless. The agency cost impedes the firms' growth. Secondly, the study suggests that firms should not worry about the firms' size because it boosts the firms' growth. Instead, firms should strive to mitigate the heavy loans as they affect growth adversely.

LIMITATIONS OF THE STUDY

Our study has some limitations, which should be addressed by future research. First, the impact of CSR disclosure and not CSR performance has been analyzed on firms' growth; therefore, future studies should focus on CSR performance as an excellent measure of growth. Second, the study considered only the agency cost as the moderator for growth, ignoring the immense effect of innovation as a significant tool for the firms' growth. Thus, future research should consider innovation. Last, we have analyzed the impact of agency cost and firms' size as moderators for Pakistan companies. Future studies can evaluate such effectiveness of agency cost and innovation as moderator for China and United States.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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REFERENCES

Abdullah, F., Shah, A., and Khan, S. U. (2012). Firm performance and the nature of agency problems in insiders-controlled firms: evidence from Pakistan. *Pak. Dev. Rev.* 4, 161–182. doi: 10.30541/v51i4iipp.161-183

Abdullah, H., and Benedict, V. (2009). Fundamental and ethics theories of corporate governance. *Middle East. Financ. Econ.* 4, 88–96.

Adams, R. B., Hermalin, B. E., and Weisbach, M. S. (2010). The role of boards of directors in corporate governance: a conceptual framework and survey. *J. Econ. Lit.* 48, 58–107. doi: 10.1257/jel.48.1.58

Akben-Selcuk, E. (2019). Corporate social responsibility and financial performance: the moderating role of ownership concentration in Turkey. *Sustainability* 11, 1–10.

Anderson, R. W., Bustamante, M. C., Guibaud, S., and Zervos, M. (2018). Agency, firm growth, and managerial turnover. *J. Finan.* 73, 419–464. doi: 10.1111/jofi.12583

Bhagat, S., and Bolton, B. (2019). Corporate governance and firm performance: the sequel*. *J. Corp. Financ.* 58, 142–168. doi: 10.1016/j.jcorpfin.2019.04.006

Bhat, K. U., Chen, Y., Jebran, K., and Bhutto, N. A. (2018). Corporate governance and firm value: a comparative analysis of state and non-state owned companies in the context of Pakistan. *Corp. Gov.* 18, 1196–1206. doi: 10.1108/CG-09-2017-0208

Broadstock, D. C., Matousek, R., Meyer, M., and Tzeremes, N. G. (2019). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental & social governance implementation and innovation performance. *J. Bus. Res.* doi: 10.1016/j.jbusres.2019.07.014

Chen, W., Zhou, G., and Zhu, X. (2019). CEO tenure and corporate social responsibility performance. *J. Bus. Res.* 95, 292–302. doi: 10.1016/j.jbusres.2018.08.018

Clarkson, M. E. (1995). A stakeholder framework for analyzing and evaluating corporate social performance. *Acad. Manag. Rev.* 20, 92–117. doi: 10.5465/amr.1995.9503271994

Daily, C. M., McDougall, P. P., Covin, J. G., and Dalton, D. R. (2002). Governance and strategic leadership in entrepreneurial firms. *J. Manage.* 28, 387–412. doi: 10.1177/014920630202800307

Deegan, C., Rankin, M., and Tobin, J. (2002). An examination of the corporate social and environmental disclosures of BHP from 1983-1997: a test of legitimacy theory. *Account. Audit. Account. J.* 15, 312–343. doi: 10.1108/09513570210435861

Eckstein, D., Künzel, V., and Schäfer, L. (2016). *Risk Index 2018. Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2016 and 1997 to 2016*. Available online at: www.germanwatch.org (accessed April 27, 2020).

Ehsan, S., Nazir, M. S., Nurunnabi, M., Khan, Q. R., Tahir, S., and Ahmed, I. (2018). A multimethod approach to assess and measure corporate social responsibility disclosure and practices in a developing economy. *Sustainability* 10:2955. doi: 10.3390/su10082955

Elgergeni, S., Khan, N., and Kakabadse, N. K. (2018). Firm ownership structure impact on corporate social responsibility: evidence from austerity U.K. *Int. J. Sustain. Dev. World Ecol.* 25, 602–618. doi: 10.1080/13504509.2018.1450306

Erhemjamts, O., Li, Q., and Venkateswaran, A. (2013). Corporate social responsibility and its impact on firms' investment policy, organizational structure, and performance. *J. Bus. Ethics* 118, 395–412. doi: 10.1007/s10551-012-1594-x

Fernando, S., and Lawrence, S. (2014). A theoretical framework for CSR practices: integrating legitimacy theory, stakeholder theory and institutional theory. *J. Theor. Account. Res.* 10, 149–178.

Gabrielsson, J. (2017). *Handbook of Research on Corporte Governance and Entrepreneurship*. Cheltenham: Edward Elgar Publishing.

Gatti, L., and Seele, P. (2014). Evidence for the prevalence of the sustainability concept in European corporate responsibility reporting. *Sustain. Sci.* 9, 89–102. doi: 10.1007/s11625-013-0233-5

Gul, F. A., Krishnamurti, C., Shams, S., and Chowdhury, H. (2020). Corporate social responsibility, overconfident CEOs and empire building: agency and stakeholder theoretic perspectives. *J. Bus. Res.* 111, 52–68. doi: 10.1016/j.jbusres.2020.01.035

Ikram, M., Zhou, P., Shah, S. A. A., and Liu, G. Q. (2019). Do environmental management systems help improve corporate sustainable development? Evidence from manufacturing companies in Pakistan. *J. Clean. Prod.* 226, 628–641. doi: 10.1016/j.jclepro.2019.03.265

Javeed, S. A., and Lefen, L. (2019). An analysis of corporate social responsibility and firm performance with moderating effects of CEO power and ownership structure: a case study of the manufacturing sector of Pakistan. *Sustainability* 11:248. doi: 10.3390/su11010248

Jugend, D., Jose Chiappeta, Jabbour, C., Alves Scaliza, J. A., Sø Rocha, R., Alcides Gobbo, et al. (2018). Relationships among open innovation, innovative performance, government support and firm size: comparing Brazilian firms embracing different levels of radicalism in innovation. *Technovation* 74-75, 54–65. doi: 10.1016/j.technovation.2018.02.004

Larcker, D. F., and Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *J. Account. Econ.* 49, 186–205. doi: 10.1016/j.jacceco.2009.11.004

Li, H., Hang, Y., Shah, S. G. M., Akram, A., and Ozturk, I. (2020). Demonstrating the impact of cognitive CEO on firms' performance and CSR activity. *Front. Psychol.* 11:278. doi: 10.3389/fpsyg.2020.00278

Li, T., Munir, Q., and Abd Karim, M. R. (2017). Nonlinear relationship between CEO power and capital structure: evidence from China's listed SMEs. *Int. Rev. Econ. Financ.* 47, 1–21. doi: 10.1016/j.iref.2016.09.005

Malik, M. S., and Kanwal, L. (2018). Impact of corporate social responsibility disclosure on financial performance: case study of listed pharmaceutical firms of Pakistan. *J. Bus. Ethics* 150, 69–78. doi: 10.1007/s10551-016-3134-6

McGuinness, P. B., Vieito, J. P., and Wang, M. (2017). The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *J. Corp. Financ.* 42, 75–99. doi: 10.1016/j.jcorpfin.2016.11.001

Oh, W. Y., Chang, Y. K., and Jung, R. (2019). Board characteristics and corporate social responsibility: does family involvement in management matter? *J. Bus. Res.* 103, 23–33. doi: 10.1016/j.jbusres.2019.05.028

Saeidi, S. P., Sofian, S., Saeidi, P., Saeidi, S. P., and Saaeidi, S. A. (2015). How does corporate social responsibility contribute to firm financial performance? The mediating role of competitive advantage, reputation, and customer satisfaction. *J. Bus. Res.* 68, 341–350.

Sarfraz, M., He, B., Shah, S. G. M., and Fareed, Z. (forthcoming). Myth or reality? unveiling the effectiveness of hierarchical CEO succession on firm performance and cash holdings. *J. Bus. Econ. Manag.*

Sarfraz, M., Ozturk, I., Shah, S. G. M., and Maqbool, A. (2020). Contemplating the impact of the moderators agency cost and number of supervisors on corporate sustainability under the Aegis of a cognitive CEO. *Front. Psychol.* 11:965. doi: 10.3389/fpsyg.2020.00965

Sarfraz, M., Qun, W., Shah, S. G. M., and Fareed, Z. (2019). Do hierarchical jumps in CEO succession invigorate innovation? Evidence from Chinese economy. *Sustainability* 11, 1–21. doi: 10.3390/su11072017

Schreck, P., and Raithel, S. (2018). Corporate social performance, firm size, and organizational visibility: distinct and joint effects on voluntary sustainability reporting. *Bus. Soc.* 57, 742–778. doi: 10.1177/0007650315613120

Shah, S. G. M., Sarfraz, M., Fareed, Z., Rehman, M. A., Maqbool, A., and Qureshi, M. A. A. (2019a). Whether CEO succession via hierarchical jumps is detrimental or blessing in disguise? Evidence from Chinese listed firms. *Zagreb Int. Rev. Econ. Bus.* 22, 23–41. doi: 10.2478/zireb-2019-0018

Shah, S. G. M., Tang, M., Sarfraz, M., and Fareed, Z. (2019b). The aftermath of CEO succession via hierarchical jumps on firm performance and agency cost: evidence from Chinese firms. *Appl. Econ. Lett.* 26, 1744–1748. doi: 10.1080/13504851.2019.1593932

Sharif, M., and Rashid, K. (2014). Corporate governance and corporate social responsibility (CSR) reporting: an empirical evidence from commercial banks (CB) of Pakistan. *Qual. Quant.* 48, 2501–2521. doi: 10.1007/s11135-013-9903-8

Shaukat, A., Qiu, Y., and Trojanowski, G. (2016). Board attributes, corporate social responsibility strategy, and corporate environmental and social performance. *J. Bus. Ethics* 135, 569–585.

Simionescu, L. N. (2015). The gender differences effects on corporate social responsibility (CSR). *Ann. Econ. Ser.* 3, 170–175.

Su, W., and Sauerwald, S. (2018). Does corporate philanthropy increase firm value? The moderating role of corporate governance. *Bus. Soc.* 57, 599–635.

Tulung, J. E., and Ramdani, D. (2018). Independence, size and performance of the board: an emerging market research. *Corp. Ownersh. Control* 15, 201–208. doi: 10.22495/cocv15i2c1p6

Waheed, A. (2005). *NEWSLETTER Apex Consultation on Corporate Social Responsibility Strategy Held in Lahore*. Available online at: www.secp.gov.pk (accessed April 26, 2020).

Xie, J., Nozawa, W., Yagi, M., Fujii, H., and Managi, S. (2019). Do environmental, social, and governance activities improve corporate financial performance? *Bus. Strateg. Environ.* 28, 286–300. doi: 10.1002/bse.2224

Yook, K. H., Choi, J. H., and Suresh, N. C. (2018). Linking green purchasing capabilities to environmental and economic performance: the moderating role of firm size. *J. Purch. Supply Manag.* 24, 326–337. doi: 10.1016/j.pursup.2017.09.001

Zattoni, A., Douglas, T., and Judge, W. (2013). Developing corporate governance theory through qualitative research. *Corp. Gov. An. Int. Rev.* 21, 119–122. doi: 10.1111/corg.12016

Zhou, Z., Zhou, H., Peng, D., Chen, X. H., and Li, S. H. (2018). Carbon disclosure, financial transparency, and agency cost: evidence from Chinese manufacturing listed companies. *Emerg. Mark. Financ. Trade* 54, 2669–2686. doi: 10.1080/1540496X.2018.1428796

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

APPENDIX

Detail of CSR Disclosure Activities

Companies in Pakistan are doing a lot of CSR activities. We have collected the information; list of activities is very much long. By keeping in view, the nature of activities related to CSR Disclosure, these activities are divided into the 7 main categories.

- Education.
- Community Development.
- Disaster Relief.
- Environment Plantation and Forestation.
- Healthcare.
- Water Provision and Purification.
- Infrastructure Development.

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Cognitive Bias and the Extraversion Personality Shaping the Behavior of Investors

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The paper examines the direct and indirect effects (via investors' risk perception) of heuristic biases on investors' irrational behavior in decision-making. The study also investigates the moderating effect of investors' extraversion on both the direct and the indirect associations between heuristic biases and irrational decision-making. Based on survey data collected from 247 investors registered in various brokerage houses in Pakistan and the analyses (mediation and moderation) performed using the Process Macro technique (proposed by Hayes, 2017) in SPSS, the results of this study reveal that heuristic biases positively affect investors' irrational decision-making both directly and indirectly via risk perception. The results reveal that extraversion moderates both direct and indirect associations between heuristic biases and investors' irrational behavior in decision-making. Our findings carry useful practical implications for organizations' policymakers.

Keywords: cognitive biases, investor behavior, personality traits, decision making, risk perception

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INTRODUCTION

Financial theories like the efficient market hypothesis (Malkiel and Fama, 1970), the modern portfolio theory (Markowitz, 1952), and Modigliani and Miller (1958) arbitrage principle suggest that capital markets are perfectly efficient, and all investors are rational in making their investment decisions. Contrary to these theories, the prospect theory (Kahneman and Tversky, 1979) states that investors' decisions and choices are based on their perceptions of their own utility, and they do not use all of the available information (Wang, 2017), as a result of which irrational decision-making takes place. The prospect theory also suggests that investors' decisions are affected by potential losses and gains (Scalco et al., 2015) and that, when the option of profit and loss exists, investors prefer profit over loss (Emami et al., 2020). In other words, investors' decisions are based on perceived gains instead of perceived losses (Kahneman and Tversky, 1979; Baker et al., 2019).

The prospect theory posits that investors' decisions are affected by cognitive, environmental, and personal factors, so their decision-making is both bounded and irrational. Irrational investors assume that securities' market arbitrage is imperfect, as there are no free entrances and exits, so they believe that prices cannot be in equilibrium (Baker et al., 2007). Scholarship based on the prospect theory suggests that fluctuations in stock prices are based on several factors, including human errors that arise from investors' using instincts, feelings, habits, emotions, thinking, reason, risk, and social interactions to make decisions (Bannier and Neubert, 2016). Investors' investment

decisions involve cognitive biases (Fama, 1998; De Bondt et al., 2013) and heuristic biases (Oehler et al., 2018; Ceschi et al., 2019). Ajzen (1985) proposed a theory of planned behavior and argued that the behavior of an investor is based on cognitive biases. Investor's attitudes move toward the behavior, subjective norms (individual thinks differently), and perceived behavioral control. Perceived behavior control refers to the investor's belief that they can control any situation or behavior. The theory of planned behavior refers to individual beliefs and behavior. Moreover, perceived behavioral control is linked with the two magnitudes: self-efficacy and controllability. Self-efficacy shows that an investor can face or bear the difficulty, or that the investor has the potential to perform a certain task. Controllability refers to the external factors that an investor can control easily and perform well.

The concept of cognitive biases was first introduced by Kahneman and Tversky (1972) as errors in judgment, some of which are related to memory and others to the problem. Heuristic biases relate to mental shortcuts used in decision-making (Gutierrez et al., 2020) that often result in systematic errors in judgment (Kahneman and Tversky, 1972). In the stock exchange market, heuristic bias is a common phenomenon that affects investors (Tversky and Kahneman, 1974). Availability heuristic refers to the decision-making of investors based on how easy it is to bring something to mind, while representativeness heuristic helps the investors to compare the information with our mental prototypes (Rasheed et al., 2018).

Research has made valuable contributions to prospect theory and the literature on investment decision-making and cognitive biases by empirically showing that cognitive biases like heuristic thinking, overconfidence, anchoring, and confirmation biases significantly affect decision-making on investments (Hoffmann and Post, 2016). However, research on the intervening and moderating mechanisms of the relationship between the heuristic cognitive bias and decision-making is scarce, so why and when cognitive biases affect decision-making on investments remains unknown.

Drawing mainly on prospect theory, this study aims to fill in these gaps by examining the relationship between heuristic biases and investors' irrational decision-making. However, considering the lack of research on the mediating and boundary conditions of this relationship, our primary goal is to explore and bring to the fore the intervening mechanisms (risk perception) and boundary conditions (extraversion) of the relationship (Kc, 2020). We build on prospect theory to propose that investors' risk perceptions mediate the relationship, as risk perception is a vital component in the decision-making process. In fact, minimizing risk is investors' key consideration in choosing an investment or initiating a project (Wood and Zaichkowsky, 2004). Risk perception refers to a subjective judgment that deals with individuals' perception of the severity of a risk (Singh and Bhowal, 2010) when they evaluate uncertain activities (Slovic, 1987; Sartori and Ceschi, 2011). Investors' beliefs, thoughts, and judgments shape their risk perceptions (Sachse et al., 2012; Nguyen et al., 2019), which affect their investment-related decision (Wood and Zaichkowsky, 2004). Since risk-taking is a common practice for investors (Hoffmann et al., 2015), cognitive biases alone cannot describe investors' decision-making process; risk perception must be considered.

A common belief is that an investor keeps in mind the risk and return characteristics of a security or stock market while making financial decisions (Antonides and Van Der Sar, 1990; Ceschi et al., 2016; Li et al., 2020), but researchers have suggested that individuals' decision-making is a complex combination of personality characteristics and demographics (Hallahan et al., 2003; Anbar and Eker, 2010; Young et al., 2012; Weller et al., 2018). We propose that individual personality characteristics like extraversion moderate the relationship between heuristic bias and risk perception and the relationship between cognitive biases and investors' irrational decision-making (Holzmeister et al., 2020). Openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism, also called the five-factor model, are commonly used personality traits (McCrae, 2004). This study focuses on extraversion because prior publications have shown that extraversion has a significant effect on financial decision-making (Oehler et al., 2018). Extraverted personalities tend to be involved in risky decision-making because they are more outgoing and optimistic, often paying high prices for financial assets (Sartori et al., 2017). Extraverts have dominant personalities and are bold in risk-taking (Nguyen et al., 2019). We also focus on extraversion as the most influential personality trait in financial and investment decisions (Costa and McCrae, 1980) because extraversion interacts with individuals' emotional states, which influences individual investment behavior (McInish, 1980), risk perception, and decision-making (Alam et al., 2020). However, research has not explored the moderating effect of personality traits, including extraversion, in the relationship between heuristic cognitive bias and investors' irrational decision-making.

Addressing this gap matters because of the variations in individuals' cognitive biases that are due to their personality characteristics and the potential of these characteristics to influence their risk perceptions and irrational decision-making (Jurevièienë et al., 2020). This study addresses the moderating role of extraversion in both the direct and indirect relationships between heuristic biases and investors' irrational decision-making. We suggest that individuals' characteristics provide a way to understand the interrelationships among heuristic bias, risk perception, and investors' irrational decision-making. The proposed model is presented in **Figure 1**.

In short, the objective of this study is to determine the effect of heuristic biases on irrational decision-making in the presence of risk perception and personality traits. The study finds that investors' risk perceptions is a mechanism that underlies the relationship between cognitive bias (heuristic bias) and investors' irrational decision-making, thus advancing our understanding of how heuristic biases affect irrational decision-making, both directly and indirectly, via risk perception. Investors' thinking and emotions vary across personality traits, which can affect their perceptions of risk and their investment decisions, but there is little evidence about whether personality traits affect the relationship between heuristic biases and risk perception or the relationship between heuristic biases and investors' irrational decision-making. We fill this void by testing the moderating effect

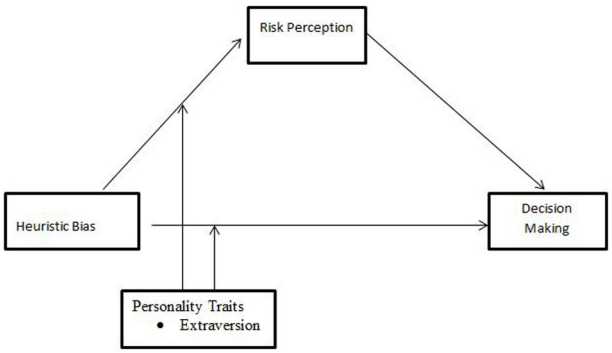

FIGURE 1 | Conceptual framework.

of extraversion on the associations of heuristic biases with risk perception and irrational decision-making.

THEORY AND HYPOTHESES DEVELOPMENT

Prospect Theory

Kahneman and Tversky's (1979) prospect theory suggests that, when the outcome is uncertain, then the investor chooses to base their decision on a perceived opportunity for gain, rather than the perceived risk of loss (Ceschi et al., 2019).

In explaining investors' decisions, many researchers have focused on cognitive biases and risk perception, given the traditional thinking that everyone is rational and uses all available information. However, behavioral finance paradigms highlight that individual thinking, emotions, and judgment errors are also reflected in investment decisions, rather than their being based only on market information. Investors' behavior is not always rational because it is sometimes based on psychological and attitudinal motives.

Cognitive Bias and Investment Decision-Making

In large, uncertain markets, complicated decisions are based on investors' intuition, perceptions, emotions, and thinking (Kahneman and Riepe, 1998), but these decisions are often irrational, as cognitive biases are involved and complete information is ignored (Du and Budescu, 2018). Research has suggested that investors have cognitive biases in the form of mental shortcuts, like heuristics, and overestimate their abilities, expertise, and knowledge (Simon et al., 2000), thus often making decisions quickly.

Investors often face a shortage of time in making decisions in complex situations because variations in share prices occur within a few seconds, so they create heuristic biases to save time (Zaleskiewicz, 2006; Shah et al., 2019). Without time to make a sophisticated probability assessment, investors make decisions based on immediately available information and estimate other values using mental short cuts like heuristics (Oehler et al., 2018). Heuristic bias is comprised of availability and representative bias (Rasheed et al., 2018). Availability bias refers to a concept or thought that comes immediately to mind when an individual makes decisions, and representativeness heuristic bias occurs when the same objects or events confuses people's thinking regarding the probability of an outcome. According to Tversky and Kahneman (1974), availability and representative heuristics are not limited to laypeople but are also used by experienced investors. When an investor makes an investment decision, he or she may assume that the current scenario is similar to a previous one and evaluate its prospects in the same way. Investors' mindsets are affected by financial intermediaries, who have a significant influence in financial markets because of price fluctuations and available information (Healy and Palepu, 2001). Available information changes the investors' preferences, and irrelevant information sometimes causes a human error and changes an investor's thinking. To get a competitive edge, investors react quickly and make decisions using the available information, suggesting that mental short cuts shape irrationality and affect investment decisions (Bowers and Khorakian, 2014). Moreover, heuristic biases occur for both experienced and inexperienced investors (Elliot et al., 2018). Therefore, we developed the following hypothesis:

H1. There is a significant positive relationship between heuristic biases and investors' irrational decision-making.

Risk Perception as a Mediator

Several studies have revealed the effect of cognitive thinking on a decision's outcome (Ishaque, 2020), but few studies have examined the relationship between biases (anchoring, heuristic thinking, disposition effect, and overconfidence) and risk perception (Sartori et al., 2014). Kahneman and Riepe (1998) found that investors make judgments about the probabilities that a particular outcome will occur and assign values to these results. Thus, norms, beliefs, and values are jointly measured in the construction of their preferences with risky options. Ritter (2003) suggested that such preferences may also create misrepresentations and identified factors that affect an individual's risk perceptions, such as cognitive biases like overconfidence and heuristic bias. If investors are aware of the level of risk, they can manage the situation more effectively and can gain more profit than they can if they are not so aware (Nguyen et al., 2019). In addition, being risk-averse affects investors' decision-making ability because they tend to perceive investments as high risk (Nguyen et al., 2019).

Risk perception refers to the subjective judgment of the intensity and severity of risk (Slovic, 1987). Investors make tradeoffs between risk level and profit margin when making investment decisions about securities, but they often follow a risk-averse approach (Kahneman and Tversky, 1979), making substantial investments in securities that give a higher return for the same risk level. The risk level also affects investment decisions in the capital market (Menkhoff et al., 2006).

When investors face identical situations and scenarios then some investors concluded that the situation is low risk, whereas other investors perceive at high risk. If risk perception influences decision making then it is important to investigate the antecedents/factors of risk perception (Nutt, 1993). Some researchers investigated that decision-making with a greater exposure to cognitive biases may reduce the risk perception (Palich and Bagby, 1995; Busenitz and Barney, 1997). Heuristic bias is subjective and may vary from individual to individual (Busenitz and Lau, 1996). Although biases help individuals cope with their cognitive limitations, they may result in less rational, less comprehensive decision-making (Barnes, 1984).

If, as argued by different researchers, cognitive biases directly influence risk perception, and risk perception directly influences an individual's decisions, then cognitive biases indirectly affect the decision through their effect on risk perception. In other words, risk perception mediates the relationship between cognitive biases and decision-making.

In this study, risk perception is used as a mediator or intervening variable. A meditational analysis determines the intermediary process that leads from the transmitted variable to the criterion variable (Baron and Kenny, 1986; Muller et al., 2005).

H2. Risk perception mediates the relationship between heuristic bias and decision-making.

The Moderating Role of Extraversion

Oehler et al. (2018) investigated the effect of extraversion and neuroticism on investment decision-making. They concluded that extraversion and neuroticism significantly affect decision-making in asset markets and that extraverted individuals tend to be excitable and to demonstrate risk-seeking behavior. Extraverted investors are often risk-takers who make massive investments in risky assets (Sartori et al., 2017).

Extraverted investors work on communications to build their relationships (Lee and Tsang, 2001). Belcher (2010) explored the effect of extraversion and neuroticism on fund managers and found that these traits significantly affect investors' decisions. Moreover, compared to other kinds of investors, extraverted investors tend to be risk-takers who invest heavily in financial assets (Belcher, 2010). Extraverted individuals are optimistic and active, and their decisions tend to be productive (Dorn and Huberman, 2005). In this study, extraversion is a moderating variable that, as defined by Muller et al. (2005), strengthens or alters the direction between the predictor variable and the outcome variable.

H3. Extraversion moderates the relationship between heuristic biases and risk perception, such that the relationship is stronger when extraversion is high.

H4. Extraversion moderates the relationship between heuristic biases and irrational decision-making, such that the relationship is stronger when extraversion is high.

As hypothesis 3 states, extraversion moderates the relationship between heuristic bias and risk perception such that the relationship is strong when extraversion is high. However, extraversion can also strengthen the indirect relationship between heuristic biases and irrational decision-making.

H5. Extraversion moderates the indirect relationship between heuristic biases and irrational decision-making, such that the relationship is stronger when extraversion is high.

RESEARCH METHOD

Data Collection and Analysis

Time-lagged (three rounds, 3 months apart) survey data were collected from 247 individual investors. Three hundred investors were contacted using the convenience sampling technique. (According to Etikan et al. (2016), when there are constraints of time and availability and with the consent of participants, convenience sampling is preferred). The sample size was determined by following Pallant (2005), who suggested five to ten respondents as a sample size against each item. Of these 300 investors, 272 gave informed consent to participate. Sealed return envelopes were provided containing the promise of confidentiality, the survey questionnaire, and an information sheet that explained the research objectives.

Data for the predicting variable and the moderating variable were gathered in the first round, along with data on the respondents' age, gender, education, and experience. Data on the mediator (risk perception) and the outcome variable (decision-making) were collected in the second and third phases/rounds, respectively. We received 268, 257, and 249 responses in the first, second, and third rounds of data collection, respectively. After the data were screened for negligence and missing values, 247 usable responses were used to test the hypothesized relationships between the variables. The net response rate was 82.33%.

Data were analyzed using structural equation modeling (SEM) in AMOS 25.0 and Hayes' PROCESS macro for SPSS 25.0. Fifty-five percent of respondents had a master's degree and 45% had an undergraduate degree. The average age and experience of the respondents were 45.61 years and 8.45 years, respectively. The purpose of using a time-lagged design was to reduce the common method variance (Podsakoff et al., 2003), so Herman's single factor was also calculated to examine the data for common method variance (Hair et al., 2010). All items were constrained into a single factor that explained 23.24% of the total variance, well below the threshold of 50% (Hair et al., 2010), suggesting that common method bias was not an issue in our data.

Demographic variables are taken as a controlled variable like gender, age, experience, qualification, and income, etc. These are the factors that affect investment decisions, as Hassan Al-Tamimi and Anood Bin Kalli (2009) reported that decision-making and financial literacy are influenced by the demographic characteristics of the respondents.

Measurement

The heuristic variable consists of availability and representative heuristic bias (Tversky and Kahneman, 1974). The availability heuristic scale consists of five items: two items adopted from Kudryavtsev et al. (2013), two items adopted from Luong and Ha (2011), and one item adopted from Waweru et al.

(2008). ("I prefer to sell stocks on the days when the value of the stock market index decreases" is a sample item). The representative heuristic was measured using six items: three items adopted from Sarwar et al. (2014), two items adopted from Waweru et al. (2008), and one item adopted from Luong and Ha (2011). ("I consider the past performance of a stock before investing in it" is a sample item). Earlier research used only these items to measure the heuristic variable. This study used all these items (combined) to measure the heuristic variable. CFA is applied to check the validity of the scale. Rasheed et al. (2018) also used the same availability and representative heuristic scale. Tversky and Kahneman (1974) also reported that heuristics bias deals with the availability and representative heuristic.

Irrational decision-making was measured using Scott and Bruce's (1995) scale. ("When making an investment, I trust my inner feelings and reactions" is a sample item). Initially, questionnaires were distributed to 100 investors consisting of five dimensions of personality traits. Results reported that 72% of respondents are of the extravert personality type. Based on pre-stage analysis, the extraversion personality trait is taken as a moderating variable. The scale developed and validated by John and Srivastava (1999) was used to measure extraversion (eight items). ("I see myself as someone who is talkative" is a sample item measuring extraversion).

Risk perception was measured by adapting four items from a 40-item scale developed and validated by Weber et al. (2002). While this scale consists of six dimensions–social, ethical, investment, health/safety, recreational, and gambling—we used only the four items for the investment dimension to measure investors' risk perception. ("I invest 10% of my annual income in stock market shares" is a sample item). The complete measurement scale is given in **Appendix 1**.

RESULTS

Means, Standard Deviation, and Correlations

Means, standard deviation (descriptive), and correlations (inferential) are presented in **Table 1**.

Measurement Model

Our measurement model consisted of heuristic biases (availability heuristic bias and representative heuristic bias), risk perception,

TABLE 1 | Means and correlations.

Construct	Means	SD	1	2	3	4	5	6
1. Heuristic bias	3.87	1.15						
2. Risk perception	3.50	1.04	0.25**					
3. Decision making	3.75	1.18	0.30**	0.24**				
4. Extraversion	3.48	1.11	0.12*	0.05	−0.04			
5. Age	45.61	11.76	−0.03	−0.07	−0.04	0.06		
6. Experience	8.45	5.50	0.02	0.03	0.01	0.03	0.83**	
7. Education	1.45	3.36	0.03	−0.06	0.04	−0.22**	−0.08	−0.09

*n = 247. *P < 0.05. **P < 0.01 level (2-tailed). SD, standard deviation. Education: 1 = undergrad; 2 = master's degree.*

TABLE 2 | Reliability and convergent validity and discriminant validities.

Construct	1	2	3	4	CR	AVE	MSV	ASV
1. Heuristic bias	**0.75**				0.93	0.56	0.12	0.07
2. Risk perception	0.30	**0.79**			0.83	0.63	0.09	0.06
3. Decision making	0.27	0.30	**0.78**		0.89	0.61	0.12	0.07
4. Extraversion	0.13	0.05	−0.03	**0.73**	0.89	0.54	0.02	0.01

n = 247. AVE, average value extracted; MSV, maximum shared variance; ASV, average shared variance; CR, composite reliability. Bolded values on the diagonals of columns 2 to 5 are the square root values of AVE.

TABLE 3 | Direct and indirect effects and 95% confidence intervals (model 2).

	β	Lower limit	Upper limit
Standardized direct effects			
Heuristic biases → Risk perception	0.30*	0.10	0.47
Heuristic biases → Decision making	0.18	−0.03	0.38
Risk perception → Decision making	0.24*	0.07	0.40
Standardized indirect effects			
Heuristic bias → Risk perception Decision making	0.07*	0.02	0.17

**Empirical 95% confidence interval does not overlap with zero. n = 247 (a sample of size 2,000 for bootstrapping).*

irrational decision-making, and extraversion. The model was assessed by using confirmatory factor analysis (CFA). One item for availability heuristic bias (AH5) and one item for risk perception (RP4) did not load significantly and was dropped. The fit indices – $\chi^2(267) = 535.87$, $\chi^2/df = 2.01$, RMSEA = 0.07, CFI = 0.92, IFI = 0.92, and TLI = 0.92 – indicate that the measurement model has a good fit with the data.

Maximum shared variance (MSV), average shared variance (ASV), and average variance extracted (AVE) indicate that the measurement model has a good fit with the data. **Table 2** shows that AVE > 0.50, ASV < MSV, and MSV and ASV < AVE for all the variables. Moreover, all of the constructs' square root values of AVE are greater than their inter-construct correlations, so the scales demonstrate satisfactory levels of discriminant and convergent validity. Cronbach alpha (α) > 0.70 (**Table 2**) shows that the internal consistency of the items is also satisfactory, as the range is reported by Fornell and Larcker (1981) and Hair et al. (2013).

Structural Model – Direct and Mediation Results

We assessed the structural model in two steps. First, the examination of the direct association of heuristic biases with irrational decision-making was examined, and shows a significant positive relationship between heuristic biases and irrational decision-making (β = 0.28, $p < 0.001$), so hypothesis 1 is supported. In the second step, investors' risk perception was included as a mediator in the relationship between heuristic biases and irrational decision-making. We used bootstrapping to assess the significance of this mediating role.

The results, shown in **Table 3**, reveal a significant positive indirect relationship between heuristic biases and irrational decision-making via risk perception (β = 0.07, 95% confidence interval did not overlap with zero). Moreover, when risk perception is included, the direct relationship between heuristic biases and irrational decision-making becomes insignificant, so hypothesis 2, that risk perception fully mediates the positive relationship between heuristic biases and irrational decision-making, is supported.

Moderation Results

We used Hayes' PROCESS model 8 to test the moderating effect of extraversion in the relationship between heuristic bias and risk perception (hypothesis 3), extraversion's direct effect on the relationship between heuristic bias and irrational decision-making (hypothesis 4), and the moderated mediation, where extraversion moderates the indirect relationship (via risk perception) between heuristic bias and irrational decision-making (hypothesis 5). The results show that the effect of the interaction term between heuristic bias and extraversion on risk perception is significant ($B = 0.30$, $p < 0.01$), suggesting that extraversion moderates the positive relationship between heuristic bias and risk perception. These interactions were plotted at +1/−1 SD from the mean of extraversion (**Figure 2**). We ran a simple regression to examine the relationship between heuristic bias and risk perception at a low and high level of extraversion

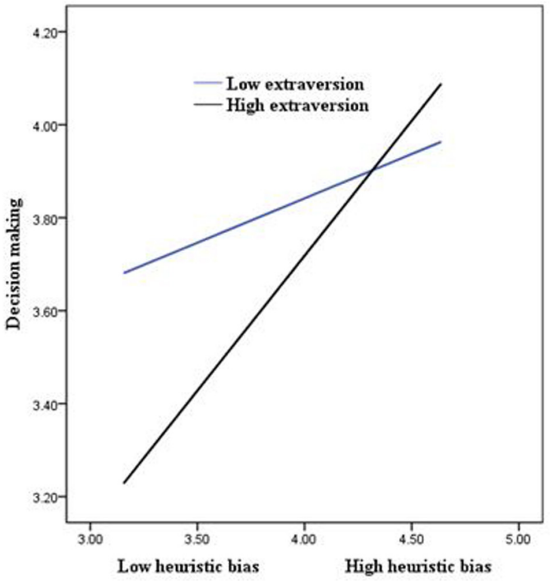

FIGURE 2 | The moderating role of extraversion in the association between heuristic bias and decision making.

and found that the relationship is strong ($B = 0.57$, $p < 0.001$) when extraversion is high and also insignificant ($B = 0.06$, ns) when extraversion is low. Thus, hypothesis 3 is supported.

The results also revealed that the effect of the interaction term between heuristic bias and extraversion on irrational decision-making is significant ($B = 0.24$, $p < 0.01$), suggesting that extraversion moderates the positive relationship between heuristic bias and irrational decision-making. These interactions were plotted at +1/−1 SD from the mean of extraversion (**Figure 3**). A simple slope test was conducted to examine the strength of the relationship between heuristic bias and irrational decision-making at high and low levels of extraversion. The results show that the relationship is significant ($B = 0.47$, $p < 0.001$) when extraversion is high and insignificant ($B = 0.05$, ns) when extraversion is low. Thus, hypothesis 4 is supported.

Finally, the results revealed that extraversion moderates the indirect relationship (via risk perception) between heuristic bias and irrational decision-making [bootstrap estimate = 0.05, bias-corrected CI (0.004, 0.11)]. As **Table 4** shows, at high extraversion (+1 SD), the indirect relationship between heuristic bias and irrational decision-making is significant, but at low extraversion (−1 SD), the indirect relationship is insignificant. Thus, hypothesis 5 is supported.

DISCUSSION – THEORETICAL CONTRIBUTIONS AND PRACTICAL IMPLICATIONS

We proposed that heuristic biases are positively related to investors' irrational decision-making, both directly and indirectly, via investors' risk perceptions, and that extraversion

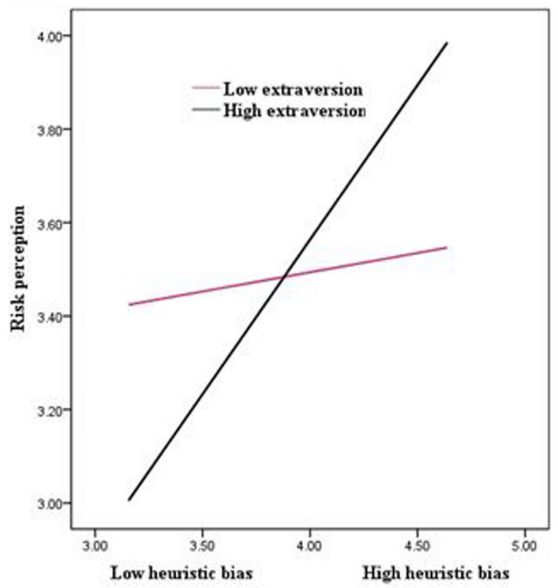

FIGURE 3 | The moderating role of extraversion in the association between heuristic bias and risk perception.

moderates both of these relationships. Based on survey data collected from 247 investors registered in various brokerage houses in Pakistan, the results of this study supported the hypothesized relationships.

The investors most likely to but those shares about which information is available instead of a complete analysis of the relevant information. The study support earlier literature about the notion that quick decisions have a significant effect on the effectiveness of investment decision-making (Hoffmann and Post, 2016; Du and Budescu, 2018) and suggest that investors use mental shortcuts in making their investment decisions. As an important contribution to the literature on investment decision-making, risk perception, and cognitive biases, the present study shows that investors' risk perceptions significantly mediate the positive relationship between heuristic bias and irrational decision-making. Slovic (1987) investigated that risk perception is a subjective judgment caused by mental shortcuts and judgment errors (heuristic) which in turn affect decision-making. In this context, the results of this study also reported that risk perception mediates the relationship between heuristic bias and investment decisions. Given the scarcity of research on the intervening mechanisms of the relationship between cognitive biases and decision-making, this contribution is timely, relevant, and significant. It provides information on how the behavior of an investor reflects on the investor's perception and decision-making. Our findings suggest that mental shortcuts, such as availability heuristics and representative heuristics, shape investors' risk perceptions, which leads to their irrational behavior in making investment decisions. Thus, the present study extends our knowledge on how heuristic biases are related to investors' irrational decision-making and the consequential potential of heuristic biases for shaping investors' risk perceptions. By showing that investors' risk perceptions mediate the positive relationship between heuristic biases and decision-making, the study also extends the nomological network of outcomes and antecedents of investors' risk perceptions. The study also reveals that risk perceptions

TABLE 4 | Extraversion as a moderator of the relationships of heuristic biases with risk perception and decision-making.

	Risk perception					Decision making				
	B	**SE**	***T***	**LL**	**UL**	***B***	**SE**	***T***	**LL**	**UL**
Age	−0.05	0.02	−2.88	−0.08	−0.01	−0.01	0.02	−0.58	−0.04	0.02
Experience	0.09	0.03	2.57	0.02	0.15	0.02	0.03	0.48	−0.05	0.08
Education	−0.11	0.12	−0.91	−0.37	0.14	0.07	0.13	0.60	−0.17	0.32
Heuristic biases	−0.72	0.32	−2.23	−1.34	−0.08	−0.57	0.31	−1.80	−1.19	0.05
Risk perception						0.16	0.06	2.53	0.03	0.28
Extraversion	−1.14	0.37	−3.07	−1.87	−0.41	−1.01	0.37	−2.74	−1.74	−0.28
Heuristic biases × extraversion	0.30	0.09	3.19	0.11	0.48	0.24	0.09	2.59	0.06	0.42
R^2	0.12					0.14				

Conditional indirect effect of heuristic bias on decision making via risk perception

	Coefficient	**Boot SE**	**LL (95% CI)**	**UL (95% CI)**
Extraversion (−1 SD)	0.01	0.02	−0.02	0.06
Extraversion (+1 SD)	0.09	0.04	0.01	0.19

Index of moderated mediation

	Index	**Boot SE**	**LL (95% CI)**	**UP (95% CI)**
	0.05	0.02	0.004	0.11

N = 247, B, unstandardized regression coefficient. Bootstrap sample size = 5000. Confidence interval = 95%. LL, lower limit; UL, upper limit; SE, standard error.

directly affect investment decisions and extends the literature by determining that better risk perceptions can improve decision-making (Nguyen et al., 2019).

The results of this study also reveal that extraversion moderates the direct and indirect relationships between heuristic biases and irrational decision-making. The findings suggest that extraverted investors demonstrate risk-seeking behavior, so they are more likely than introverted investors to invest in risky assets and use mental shortcuts in making their investment decisions. Thus, our findings contribute to the literature (Lee and Tsang, 2001; Belcher, 2010) that has suggested that individuals' personality traits play an important role in their investment decisions. Our study highlights the moderating effect of the personality trait of extraversion, which strengthens the relationship between heuristic bias and decision-making.

By establishing extraversion as a moderator of the positive association between heuristic biases and irrational decision-making, the study contributes to the literature on the links between cognitive biases and investment decision-making and enhances the scope of personality traits in finding that extraversion strengthens the relationship between heuristic biases and investors' risk perceptions.

The study's findings could help investors, organizations' policymakers, brokerage houses, and industrialists learn how risk perceptions influence their decision-making, how extraversion influences risk perceptions and decision-making, and that errors and deviations have significant effects on investors' ability (thinking and reasoning) to make sound decisions. The study's findings can help managers and policymakers understand the role of investors' personality traits in their risk perceptions and decision-making and how cognitive biases vary based on personality traits. This study also contributes to prospect theory, as it explains how heuristic biases are linked to investors' irrational decision-making through risk perceptions.

Limitations and Recommendations for Research

Our study is based on data from Pakistani investors, so future research could study these relationships in other contexts to enhance the generalizability of our findings. We used a time-lagged design that reduced the common method variance, but drawing strong causal inferences may not be possible using the time-lagged design, so we suggest the use of experimental and longitudinal policies to draw causal inferences about the interrelationships among heuristic biases, investors' risk perceptions, and investors' irrational behavior in making investment decisions.

This study focuses on the heuristic bias, but many other cognitive biases, such as overconfidence, may affect investors' decision-making and should also be considered. Moreover, we focused only on extraversion, so future research could examine the impact of other personality traits to enhance our understanding of the role of personality traits in investors' irrational decision-making. Financial literacy may play a significant role as an independent variable in irrational decision-making in the presence of risk perception, so future research could also examine the effect of financial literacy on investors' irrational decision-making. In addition, future research could look at the political impact of other biases on investors or perform a comparative study on the commodity market and equity market investors. To find the different behavioral effects, research could be performed on the individual investors of the stock exchange and commodity market investors. Moreover, demographic characteristics can be used as a moderating variable in future research.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

This study involving human participants was reviewed and approved by the Ethics Committee of the Department of Management Sciences, COMSATS University Islamabad, Lahore Campus, Lahore, Pakistan. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

The authors identifies the research gap that how investors make a decision when there is a shortage of time and also how risk perception and extraversion personality shaping the behavior of investors. All authors contributed to the article and approved the submitted version.

REFERENCES

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior. In Action control (11-39)*. Berlin: Springer.

Alam, M. N., Masroor, I., and Nabi, M. N. U. (2020). Does entrepreneurs' risk perception influence firm's rapidity in foreign market entry through moderation of entrepreneurial decision-making approach? *Rev. Int. Bus. Strat.* 2020:106.

Anbar, A., and Eker, M. (2010). An empirical investigation for determining of the relation between personal financial risk tolerance and demographic characteristic. *Ege Acad. Rev.* 10, 503–523. doi: 10.21121/eab.2010219633

Antonides, G., and Van Der Sar, N. L. (1990). Individual expectations, risk perception and preferences in relation to investment decision making. *J. Econ. Psychol.* 11, 227–245. doi: 10.1016/0167-4870(90)90005-t

Baker, H. K., Kumar, S., Goyal, N., and Gaur, V. (2019). How financial literacy and demographic variables relate to behavioral biases. *Manag. Fina.* 45, 124–146. doi: 10.1108/mf-01-2018-0003

Baker, M., Ruback, R. S., and Wurgler, J. (2007). *Behavioral corporate finance. In Handbook of empirical corporate finance*. Netherland: Elsevier, 145–186.

Bannier, C. E., and Neubert, M. (2016). Gender differences in financial risk taking: The role of financial literacy and risk tolerance. *Econ. Lett.* 145, 130–135. doi: 10.1016/j.econlet.2016.05.033

Barnes, J. H. Jr. (1984). Cognitive biases and their impact on strategic planning. *Strat. Manag. J.* 5, 129–137. doi: 10.1002/smj.4250050204

Baron, R. M., and Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. personal. Soc. Psychol.* 51:1173. doi: 10.1037/0022-3514.51.6.1173

Belcher, L. J. (2010). Prior perceptions, personality characteristics and portfolio preferences among fund managers: an experimental analysis. *J. Behav. Fina.* 11, 239–248. doi: 10.1080/15427560.2010.527412

Bowers, J., and Khorakian, A. (2014). Integrating risk management in the innovation project. *Eur. J. Innovat. Manag.* 17, 25–40. doi: 10.1108/ejim-01-2013-0010

Busenitz, L. W., and Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *J. Bus. Vent.* 12, 9–30. doi: 10.1016/s0883-9026(96)00003-1

Busenitz, L. W., and Lau, C. M. (1996). A cross-cultural cognitive model of new venture creation. *Entrepr. Theor. Pract.* 20, 25–40. doi: 10.1177/104225879602000403

Ceschi, A., Costantini, A., Sartori, R., Weller, J., and Di Fabio, A. (2019). Dimensions of decision-making: an evidence-based classification of heuristics and biases. *Personal. Indiv. Diff.* 146, 188–200. doi: 10.1016/j.paid.2018.07.033

Ceschi, A., Costantini, A., Scalco, A., Charkhabi, M., and Sartori, R. (2016). The relationship between the big five personality traits and job performance in business workers and employees' perception. *Int. J. Bus. Res.* 16, 63–76. doi: 10.18374/ijbr-16-2.5

Costa, P. T., and McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: happy and unhappy people. *J. Personal. Soc. Psychol.* 38:668. doi: 10.1037/0022-3514.38.4.668

De Bondt, W., Mayoral, R. M., and Vallelado, E. (2013). Behavioral decision-making in finance: An overview and assessment of selected research. *Span. J. Fin. Accoun.* 42, 99–118. doi: 10.1080/02102412.2013.10779742

Dorn, D., and Huberman, G. (2005). Talk and action: What individual investors say and what they do. *Rev. Fina.* 9, 437–481. doi: 10.1007/s10679-005-4997-z

Du, N., and Budescu, D. V. (2018). How (Over) Confident Are Financial Analysts? *J. Behav. Fin.* 19, 308–318. doi: 10.1080/15427560.2018.1405004

Elliot, W. B., Rennekamp, K. M., and White, B. J. (2018). The Paradoxical Behavioral Effects of a Directional Goal on Investors' Risk Perceptions and Valuation Judgments. *J. Behav. Fina.* 19, 271–290. doi: 10.1080/15427560.2018.1381961

Emami, A., Welsh, D. H., Ramadani, V., and Davari, A. (2020). The impact of judgment and framing on entrepreneurs' decision-making. *J. Small Bus. Entrepr.* 32, 79–100. doi: 10.1080/08276331.2018.1551461

Etikan, I., Musa, S. A., and Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *Am. J. Theoret. Appl. Stat.* 5, 1–4. doi: 10.11648/j.ajtas.20160501.11

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *J. Fina. Econ.* 49, 283–306.

Fornell, C., and Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: algebra and statistics. *J. Market. Res.* 18, 382–388. doi: 10.1177/002224378101800313

Gutierrez, C., Åstebro, T., and Obloj, T. (2020). The impact of overconfidence and ambiguity attitude on market entry. *Organiz. Sci.* 31, 308–329. doi: 10.1287/orsc.2019.1300

Hair, J. F., Anderson, R. E., Babin, B. J., and Black, W. C. (2010). Multivariate data analysis: A global perspective (Vol. 7). *Upper Saddle River, NJ: Pearson*.

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2013). *Multivariate data analysis: Pearson new international edition*. London: Pearson Higher Ed.

Hallahan, T., Faff, R., and McKenzie, M. (2003). An exploratory investigation of the relation between risk tolerance scores and demographic characteristics. *J. Multinat. Fina. Manag.* 13, 483–502. doi: 10.1016/s1042-444x(03)00022-7

Hassan Al-Tamimi, H. A., Anood Bin, and Kalli, A. (2009). Financial literacy and investment decisions of UAE investors. *J. Risk Fina.* 10, 500–516. doi: 10.1108/15265940911001402

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Publications.

Healy, P. M., and Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *J. Accoun. Econ.* 31, 405–440. doi: 10.1016/s0165-4101(01)00018-0

Hoffmann, A. O., and Post, T. (2016). How does investor confidence lead to trading? Linking investor return experiences, confidence, and investment beliefs. *J. Behav. Exper. Fina.* 12, 65–78. doi: 10.1016/j.jbef.2016.09.003

Hoffmann, A. O., Post, T., and Pennings, J. M. (2015). How investor perceptions drive actual trading and risk-taking behavior. *J. Behav. Fina.* 16, 94–103. doi: 10.1080/15427560.2015.1000332

Holzmeister, F., Huber, J., Kirchler, M., Lindner, F., Weitzel, U., and Zeisberger, S. (2020). What Drives Risk Perception? A Global Survey with Financial Professionals and Laypeople. *Manag. Sci.* 2020:33.

Ishaque, M. (2020). Cognitive approach to understand the impact of conflict of interests on accounting professionals' decision-making behaviour. *Accoun. Forum.* 44, 64–98. doi: 10.1080/01559982.2019.1583303

John, O. P., and Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Hand. Personal. Theor. Res.* 2, 102–138.

Jurevičienė, D., Skvarciany, V., and Lagunavičiūtė, A. (2020). Factors influencing individuals' decision-making and causing financial crisis. *J. Bus. Econ. Manag.* 21, 1149–1164. doi: 10.3846/jbem.2020.12890

Kahneman, D., and Riepe, M. W. (1998). Aspects of investor psychology. *J. Portf. Manag.* 24, 52–60. doi: 10.3905/jpm.1998.409643

Kahneman, D., and Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology*, 3(3), 430–454. doi: 10.1016/0010-0285(72)90016-3

Kahneman, D., and Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica* 47, 263–291. doi: 10.2307/1914185

Kc, D. S. (2020). Heuristic thinking in patient care. *Manag. Sci.* 66, 2545–2563. doi: 10.1287/mnsc.2019.3332

Kudryavtsev, A., Cohen, G., and Hon-Snir, S. (2013). 'Rational'or'Intuitive': Are Behavioral Biases Correlated Across Stock Market Investors? *Contemp. Econ.* 7, 31–53. doi: 10.5709/ce.1897-9254.81

Lee, D. Y., and Tsang, E. W. (2001). The effects of entrepreneurial personality, background and network activities on venture growth. *J. Manag. Stud.* 38, 583–602. doi: 10.1111/1467-6486.00250

Li, H., Hang, Y., Shah, S. G. M., Akram, A., and Ozturk, I. (2020). Demonstrating the Impact of Cognitive CEO on Firms' Performance and CSR Activity. *Front. Psychol.* 11:278.

Luong, L. P., and Ha, T. T. D. (2011). *Behavioral factors influencing individual investor? s decision making and performance*. Germany: Springer.

Malkiel, B. G., and Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *J. Fina.* 25, 383–417. doi: 10.2307/2325486

Markowitz, H. M. (1952). Portfolio Selection/Harry Markowitz. *J. Fina.* 7, 77–91.

McCrae, R. R. (2004). Human nature and culture: A trait perspective. *J. Res. Personal.* 38, 3–14. doi: 10.1016/j.jrp.2003.09.009

McInish, T. H. (1980). A game-simulation of stock market behavior: An extension. *Simulat. Games* 11, 477–484.

Menkhoff, L., Schmidt, U., and Brozynski, T. (2006). The impact of experience on risk taking, overconfidence, and herding of fund managers: Complementary survey evidence. *Eur. Econ. Rev.* 50, 1753–1766. doi: 10.1016/j.euroecorev.2005.08.001

Modigliani, F., and Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American* 1, 261–297.

Muller, D., Judd, C. M., and Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *J. Personal. Soc. Psychol.* 89:852. doi: 10.1037/0022-3514.89.6.852

Nguyen, L., Gallery, G., and Newton, C. (2019). The joint influence of financial risk perception and risk tolerance on individual investment decision-making. *Accoun. Fina.* 59, 747–771. doi: 10.1111/acfi.12295

Nutt, P. C. (1993). The formulation processes and tactics used in organizational decision making. *Organiz. Sci.* 4, 226–251. doi: 10.1287/orsc.4.2.226

Oehler, A., Wendt, S., Wedlich, F., and Horn, M. (2018). Investors' personality influences investment decisions: Experimental evidence on extraversion and neuroticism. *J. Behav. Fina.* 19, 30–48. doi: 10.1080/15427560.2017.1366495

Palich, L. E., and Bagby, D. R. (1995). Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *J. Bus. Vent.* 10, 425–438. doi: 10.1016/0883-9026(95)00082-j

Pallant, J. (2005). *SPSS survival guide*. Australia: Allen and Unwin.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and

recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Rasheed, M. H., Rafique, A., Zahid, T., and Akhtar, M. W. (2018). Factors influencing investor's decision making in Pakistan: Moderating the role of locus of control. *Rev. Behav. Fina.* 10, 70–87. doi: 10.1108/rbf-05-2016-0028

Ritter, J. R. (2003). Behavioral finance. *Pacif. Bas. Fina. J.* 11, 429–437.

Sachse, K., Jungermann, H., and Belting, J. M. (2012). Investment risk–The perspective of individual investors. *J. Econ. Psychol.* 33, 437–447. doi: 10.1016/j.joep.2011.12.006

Sartori, R., and Ceschi, A. (2011). Uncertainty and its perception: experimental study of the numeric expression of uncertainty in two decisional contexts. *Qual. Quant.* 45, 187–198. doi: 10.1007/s11135-010-9365-1

Sartori, R., Ceschi, A., and Scalco, A. (2014). "Differences between entrepreneurs and managers in large organizations: an implementation of a theoretical multi-agent model on overconfidence results," in *Distributed Computing and Artificial Intelligence, 11th International Conference*, (Cham: Springer), 79–83. doi: 10.1007/978-3-319-07593-8_10

Sartori, R., Costantini, A., Ceschi, A., and Scalco, A. (2017). Not only correlations: a different approach for investigating the relationship between the Big Five personality traits and job performance based on workers and employees' perception. *Qual. Quant.* 51, 2507–2519. doi: 10.1007/s11135-016-0406-2

Sarwar, A., Mansoor, Z., and Butt, N. S. (2014). Investor's behavior in Pakistan mercantile exchange (pmex). *Sci. Int.* 26, 1371–1377.

Scalco, A., Ceschi, A., Sartori, R., and Rubaltelli, E. (2015). "Exploring selfish versus altruistic behaviors in the ultimatum game with an agent-based model," in *Trends in practical applications of agents, multi-agent systems and sustainability*, (Cham: Springer), 199–206. doi: 10.1007/978-3-319-19629-9_22

Scott, S. G., and Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educat. Psychol. Measur.* 55, 818–831. doi: 10.1177/0013164495055005017

Shah, S. G. M., Tang, M., Sarfraz, M., and Fareed, Z. (2019). The aftermath of CEO succession via hierarchical jumps on firm performance and agency cost: Evidence from Chinese firms. *Appl. Econ. Lett.* 26, 1744–1748. doi: 10.1080/13504851.2019.1593932

Simon, M., Houghton, S. M., and Aquino, K. (2000). Cognitive biases, risk perception, and venture formation: How individuals decide to start companies. *J. Bus. Vent.* 15, 113–134. doi: 10.1016/s0883-9026(98)00003-2

Singh, R., and Bhowal, A. (2010). Risk perception of employees with respect to equity shares. *J. Behav. Fina.* 11, 177–183. doi: 10.1080/15427560.2010.507428

Slovic, P. (1987). Perception of risk. *Science* 236, 280–285.

Tversky, A., and Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science* 185, 1124–1131.

Wang, X. (2017). Investor attention strategy. *J. Behav. Fina.* 18, 390–399. doi: 10.1080/15427560.2017.1344674

Waweru, N. M., Munyoki, E., and Uliana, E. (2008). The effects of behavioral factors in investment decision-making: a survey of institutional investors operating at the Nairobi Stock Exchange. *Int. J. Bus. Emerg. Market.* 1, 24–41. doi: 10.1504/ijbem.2008.019243

Weber, E. U., Blais, A. R., and Betz, N. E. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *J. Behav. Dec. Mak.* 15, 263–290. doi: 10.1002/bdm.414

Weller, J., Ceschi, A., Hirsch, L., Sartori, R., and Costantini, A. (2018). Accounting for individual differences in decision-making competence: Personality and gender differences. *Front. Psychol.* 9:2258.

Wood, R., and Zaichkowsky, J. L. (2004). Attitudes and trading behavior of stock market investors: a segmentation approach. *J. Behav. Fina.* 5, 170–179. doi: 10.1207/s15427579jpfm0503_5

Young, S., Gudjonsson, G. H., Carter, P., Terry, R., and Morris, R. (2012). Simulation of risk-taking and its relationship with personality. *Personal. Indiv. Diff.* 53, 294–299. doi: 10.1016/j.paid.2012.03.014

Zaleskiewicz, T. (2006). *Behavioral finance. Handbook of Contemporary Behavioral Economics*. New York: Sharpe, 706–728.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

APPENDIX

APPENDIX A | Measurement items.

Items	Description	References
	Availability heuristic	
AH1	I prefer to sell stocks on the days when the value of the stock market index decreases	Waweru et al. (2008);
AH2	I prefer to buy stocks on the days when the value of the stock market index increases	Luong and Ha (2011);
AH3	I prefer to invest in local stocks than international stocks because the information of local stocks is more available	Kudryavtsev et al. (2013)
AH4	I consider the information from my close friends and relatives as the reliable reference for my investment decisions	
AH5	I prefer to buy local stocks than trade in international ones	
	Representative heuristic	
RH1	I consider the past performance of the stocks before investing	Waweru et al. (2008);
RH2	I believe that through detailed analysis of past performance, future value of a contract in the stock market can be determined	Luong and Ha (2011);
RH3	I avoid investments in stocks that have a history of poor earnings	Sarwar et al. (2014)
RH4	I buy 'hot' stocks which provided the most return recently and avoid stocks that have performed poorly in the recent past	
RH5	I use trend analysis to make investment decisions	
RH6	Before investing I use trend analysis of some representative stocks to make investment decisions for all stocks	
	Decision making	
DM1	When making an investment, I trust my inner feelings and reactions	Scott and Bruce (1995)
DM2	I generally make investments that feel right to me	
DM3	When making investments, I rely upon my instincts	
DM4	When I make an investment, it is more important for me to feel the investment is right than have a rational reason for it	
DM5	When I make investments, I tend to rely on my intuition	
	Personality traits	
	I see myself as someone who	John and Srivastava (1999)
E1	Is talkative	
E2	Is reserved	
E3	Is full of energy	
E4	Generates a lot of enthusiasm	
E5	Tends to be quiet	
E6	Has an assertive personality	
E7	Is sometimes shy, inhibited	
E8	Is outgoing, sociable	
	Risk perception	
RP1	I invest 10% of my annual income in stock market shares	Weber et al. (2002)
RP2	I invest 5% of my annual income in a very speculative share	
RP3	I invest 5% of my annual income in a conservative stock	
RP4	I invest 10% of my annual income in government bonds (treasury bills)	

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How Investors Attitudes Shape Stock Market Participation in the Presence of Financial Self-Efficacy

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The purpose of this study is to investigate how investor's money attitudes shape their stock market participation (SMP) decisions. This study followed the theory of planned behavior (TPB), and a survey was conducted to collect the responses from active investors. Structural equation modeling (SEM) was used for the analysis of proposed relationships among the constructs, and a confirmatory factor analysis (CFA) was conducted to check the interrelation of the variables and validity of the constructs. This research has concluded that investor's money attitudes are significant to affect their stock market participation decisions. Further, it was found that risk attitudes partially mediate the relationship between money attitudes and stock market participation. Moreover, financial knowledge and financial self-efficacy positively moderated the relationship between money attitudes and stock market participation. This research is one of the early attempts at studying the money attitudes of investors and introduces financial self-efficacy as a moderating construct between money attitudes and stock market participation. The sample size for this study was 250 respondents which can be increased in future research, and the same relationships can be tested by using a larger sample. Moreover, this study has used money attitudes as predictors of stock market participation. Still, many other variables, like personal value, can also be taken to investigate their influence on stock market participation.

Keywords: money attitudes, stock market participation, risk attitudes, financial self-efficacy, financial knowledge

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INTRODUCTION

Behavioral finance is knowing investor's psychology related to financial decisions and is a combination of two disciplines, i.e., psychology and economics. This combination clarifies why and how people make irrational financial decisions when they save, invest, spent, and borrow money (Belsky and Gilovich, 1999). It is a blend of personal and social psychology principles with traditional finance theory to investigate and emphasize the stock market performance. Behavioral finance theory relies on how the thinking process and cognitive errors impact investor choice and prices of the stock exchange (Dam, 2017). Investors do not follow the rational models of investment which are assumed in the theory of efficient markets and there exist significant variations in the behavior of investors (Wärneryd, 2001; Riitsalu and Murakas, 2019).

For quite a long time, studies have been attempting to get a better understanding of stock market participation and the parameters impacting individual's decisions whether or not participate in

the stock market (Heaton and Lucas, 2000; Seasholes and Zhu, 2010; Korniotis and Kumar, 2011; Barber and Odean, 2013; Sivaramakrishnan et al., 2017; Bamforth et al., 2018; Ponchio et al., 2019). Previous studies have identified several factors that shape participation in the stock market, including demographics, education, social capital, income level, IQ level, investment knowledge, optimistic beliefs, financial literacy, peer effects, financial self-efficacy, stock market experiences, herding, heuristics, and cultural factors (Hong et al., 2004; Campbell, 2006; Brown et al., 2008; Georgarakos and Pasini, 2011; Grinblatt et al., 2011; Hurd et al., 2011; Malmendier and Nagel, 2011; Van Rooij et al., 2011; Bonaparte and Kumar, 2013; Calvet and Sodini, 2014; Kengatharan and Kengatharan, 2014; Li, 2014; Arrondel et al., 2015; Balloch et al., 2015; Gao, 2015; Gao et al., 2019; Liivamägi et al., 2019; Zou and Deng, 2019).

Individuals invest in the stock market to save their income for retirement (Clark-Murphy and Soutar, 2004). Stock market participation alludes to investing in the stock exchange by purchasing the shares of companies to increase wealth. Investments are committing money in an organization for a specific period with the aim of getting a return on it (Reilly and Brown, 2011). Stock market participation has extraordinary significance as it helps asset accumulation, welfare, and consumption smoothing (Cole and Shastry, 2009). Lack of stock market participation leads to welfare losses being imposed on the economy (Cocco et al., 2005). Different research has investigated the psychology of investing in the stock market (Wäneryd, 2001). Behavioral preferences and beliefs have been shown to significantly affect stock market participation (Dimmock and Kouwenberg, 2010; Georgarakos and Pasini, 2011). Demographics and background risk factors have a significant impact on stock market participation (Campbell, 2006).

Participation in financial markets has increased sharply recently (Van Rooij et al., 2011; Calvet et al., 2016). Exploring the causes of why individuals avoid stock market participation is crucial both on an individual and aggregate level (Luotonen, 2009) and it has become essential to investigate the factors that influence stock market participation. Literature has indicated that distinctive psychological factors impact stock market participation like investor's beliefs, preferences, and psychological biases (Hilton, 2001; Daniel et al., 2002). A comprehensive set of traits clarifies the level of investments using stock market participation, although stock market literacy takes on a predominant role as indicated by Balloch et al. (2014). Literature has shown that variations in finance level and risk aversion do not agreeably explain investor's choices whether to invest or not (Conlin et al., 2015).

As stock investment is generally talked about among individuals, the vast majority have built up specific attitudes about stock investment. Investment attitudes are fundamental for differentiating beginner investors who have not had investment experience yet, thus have not built any behaviors related to investment strategies. Attitudes anticipate behavior effectively when there is a high correspondence between the attitude object and the behavioral option (Tang and Baumeister, 1984; Grant and Beck, 2008). Adam and Shauki (2014) contended that under sensible considerations, individual's attitudes significantly impact their sustainable investment decisions. Previous research related to financial problems revealed that money attitudes significantly change an individual's financial management and the level of economic well-being (Shim et al., 2009; Phan et al., 2019). Likewise, money attitudes are viewed as critical when making investment decisions (Furnham, 1984; Wood and Zaichkowsky, 2004; Keller and Siegrist, 2006b). Choices taken in terms of money depend on money behavior which is the outcome of the effect of money attitudes. Individual money attitudes depend on various components, for instance, a person's childhood experience, education, financial, and societal position. Based on these segments, money attitude differs from individual to individual.

Evidence recommends that the money behavior of investors should be developed based on these money attitudes (Roberts and Jones, 2001), as supported by the findings of Keller and Siegrist (2006b) and Dowling et al. (2009) that the investor's financial decisions are based on money attitudes (Klontz et al., 2011). Previous studies defined monetary intelligence (MI) as individuals' money attitudes to elaborate techniques to achieve financial happiness (Rose et al., 2016; Tang, 2016). Wood and Zaichkowsky (2004) investigated the attitude and trading behavior of investors and categorized them into four sections, i.e., risk intolerant, confident, less risk-averse young, and conservative long term investors.

Risk attitudes additionally explained stock market participation, for example, uncertainty dispersion, investors affinity to bet, the presence of a significant negative wealth shock, religion-incited betting attitudes, disclosure of corporate extortion in the society, and enormous hedging potential (Bonaparte et al., 2014; Giannetti and Wang, 2016). Individual's risk attitudes are essential for deciding investment decisions (Barsky et al., 1997; Dimmock and Kouwenberg, 2010; Kumar et al., 2011; Giannetti and Wang, 2016). This research has considered risk attitudes to clarify the puzzle in stock market participation. This study intends to identify the influence of risk attitudes between the relationship of money attitudes and stock market participation focusing on the results of the research (Barsky et al., 1997) that an individual's level of risk-taking in one place predicts risky behavior in another place.

Further, the literature has shown that cognitive ability essentially influences stock market participation, for instance, high financial literacy and a person's intelligence quotient. Lapp (2010) inferred that a higher financial self-efficacy level leads to fewer financial problems. Fox and Bartholomae (2008) described financial self-efficacy as "knowledge and ability to affect and control one's money related issues." Besides, perceived behavioral control (which incorporates FSE) predicts positive monetary practices (Xiao et al., 2014). Likewise, Falahati and Paim (2011) considered financial knowledge as a critical component to improve behavior related to finance, thus influencing monetary prosperity (Saurabh and Nandan, 2018). Perry and Morris (2005) reasoned that financial knowledge emphatically impacts people's economic behavior as financially literate people will exhibit more responsible financial behavior. Further, other individual attributes impacting stock market participation like age, gender,

wealth, risk aversion, and education are also discussed in the literature (Georgarakos and Pasini, 2011; Almenberg and Dreber, 2015; Arts, 2018).

According to the best of the researcher's knowledge, very little research has been found that focuses on investor's money attitudes to explain their stock market participation (Keller and Siegrist, 2006a). Specifically, this research broadens the thought of monetary intelligence and investigates the degree to which investors adopt their money attitudes to "frame" (Tversky and Kahneman, 1981) effects of stock exchanges. The relationship between attitudes and behavior has been concentrated widely, yet research on money attitudes and stock market participation behavior is less abundant. This investigation can offer a new understanding that can be an essential expansion to the knowledge that previously exists. Thus, this research can fill the gap in research that explains how investor's money attitudes affect stock market participation behavior (theory of planned behavior, i.e., TPB) and to overcome the difference between stock volatility and behavioral finance, and monetary intelligence. Money attitudes can be perceived in clarifying stock market participation and are an emerging research issue in behavioral finance. In this manner, it appears to be sensible to ask whether money attitudes may play a role in stock market participation.

LITERATURE REVIEW

Ajzen (1985) proposed the theory of planned behavior (TPB) which was extracted from the theory of reason actions (Ajzen and Fishbein, 1980). The TPB lies among the valid models that explain human behavior (Ajzen, 1991). This theory states human behavior is affected through motivational factors like attitudes and perceived behavioral control. Attitudes can be expressed as "the degree to which an individual derives a positive or negative valuation from performing a specific behavior" (Ajzen, 1991). Further, the TPB intends to forecast conduct which is not entirely volitional by variable, for example, perceived behavioral control (Ajzen, 1991). This research follows the theory of planned behavior (TPB) which points out "*individual's attitudes to behavior, subjective norms, and perceived behavioral control significantly affect their behavior intentions and behaviors*."

Additionally, this theory primarily deals with attitude—a part of behavioral finance that assumes a critical job in stock market participation. A number of research has used the TPB to predict investor's money attitudes in participating in financial markets and offered a basis to apply the TPB in stock market participation. The theory of planned behavior (TPB) focuses on the intentions of the individuals in performing specific behaviors. As indicated by this theory, determinants of intentions are attitudes, subjective norms, and perceived behavioral control. Attitudes show the level of an individual's evaluation of behavior which can be favorable or unfavorable. Likewise, the subjective norm is perceived as social pressure in performing or not performing a specific behavior. Perceived behavioral control refers to control (ease or difficulty) of an individual in performing a specific behavior. Generally, favorable attitudes to specific behavior lead to a strong intention to perform that behavior (Ajzen, 1991; Ajzen and Driver, 1992).

Money Attitudes and Stock Market Participation

Money attitudes can be defined as people's attitudes that portray behavior in money matters (Klontz et al., 2011). People build up attitudes toward money on the premise of circumstances and experiences that they encounter over their lifetime. Money attitudes have four dimensions, i.e., money avoidance, money worship, money status, and money vigilance (Klontz et al., 2011). Individuals have different attitudes regarding money, for example, some people like it a lot (money worship), others do not take interest in money (money avoidance), a few people want to increase their status through money (money status), and others consider money as a source of shame (money vigilance). Money avoidance refers to believing that money is bad, that wealthy individuals are greedy and that they do not deserve money. Individuals may avoid spending money on even sensible or essential purchases. Individuals believing in the money worship dimension are convinced that more cash will solve the majority of their issues, that there will never be a sufficient amount, and that cash brings power and happiness. Individuals with money status dimensions see a clear distinction between socio-economic classes. Status lovers believe that owning the best and most current things gives status. In the money vigilance dimension, individuals consider that money is a profound source of shame and mystery, whether one has a lot or a little. The money vigilance element appears to be connected to alertness, readiness, watchfulness, and worry about money, and the feeling that one must be aware of pending inconvenience or threat (Klontz et al., 2011).

Literature has demonstrated that investors tempted by big returns have lost their money like in the 2008 Asia financial storm which shows that financial decisions are more complex when compared to past occurrences. Despite the fact that investors might acquire financial knowledge there still exists confusion about investing more appropriately. Along these lines, financial decisions require more accurate judgments on the part of investors. Recently, many studies have focused on psychological factors like cognitive abilities that affect stock market participation (Christelis et al., 2010). Likewise, attitudes toward money can be considered an important factor influencing stock market participation decisions as supported by Klontz et al. (2011) and Shih and Ke (2014). The literature on financial behaviors has focused more on exploratory and descriptive analyses and little attention has been given to aspects like attitudinal theoretical foundations.

Literature has shown that money attitudes have a significant influence on stock market participation and financial behaviors (Furnham, 1984; Chang and Hanna, 1992; Tang, 1992; Watson, 2003; Wood and Zaichkowsky, 2004; Canova et al., 2005; Perry and Morris, 2005; Keller and Siegrist, 2006b; Shim et al., 2009; Gambetti and Giusberti, 2012; Phan et al., 2019). Medina et al. (1996) have concluded that money is an important part of an individual's life and it motivates the behaviors of people in different ways. Literature has affirmed that different investor groups having distinct money attitude types when investing in different financial assets (Wood and Zaichkowsky, 2004).

The important money attitude scales discussed in the literature are the money attitudes scale (MAS), the money beliefs and behaviors scale (MBBS), and the money ethic behavior scale (MES) (Yamauchi and Templer, 1982; Furnham, 1984; Tang, 1992). Häusler et al. (2018) studied beliefs and stocks trading behavior and concluded that actions in the anterior insula while judging risky and safe decisions in investment activity are correlated with the stock trading behaviors of the individuals.

Likewise, money attitudes have a significant impact on an individual's investment decisions (Furnham, 1984; Wood and Zaichkowsky, 2004; Keller and Siegrist, 2006b). Further, money attitudes also significantly influence individual's financial management and economic well-being (Shim et al., 2009; Phan et al., 2019). Money attitudes shape investor's money behavior (Roberts and Jones, 2001; Keller and Siegrist, 2006b; Dowling et al., 2009) while investor's financial decisions are based on money attitudes (Klontz et al., 2011). Akhtar and Das (2019) have used the theory of planned behavior (TPB) and concluded that attitude partially moderates the relationship between financial knowledge and investment intentions.

People have turned out to be increasingly active in stock markets, and participation has been advanced by the introduction of new monetary products and services. However, a portion of these products is hard to grasp, particularly for monetarily unsophisticated investors. Standard models of portfolio choice consider that knowledgeable investors make rational decisions to augment lifetime utility. There are various motivations to presume that one's choice about whether to put resources into stocks might be impacted by one's money attitudes that are created through social interaction, education, and experience. The literature discussed has shown distinct insights into money attitudes, financial literacy, and financial behaviors; their applicability to Pakistan is limited. To date, little research has been conducted to investigate the influence of money attitudes of investors on their stock market participation decisions (Keller and Siegrist, 2006a). This study has a specific focus on attitudes toward money (money attitudes) of investors and the influence of these money attitudes on their stock market participation decisions. This research has developed a conceptual model that explains the psychological process of investor's stock market participation.

H_1: There is a significant impact of money attitudes on stock market participation of investors.

Financial Knowledge and Stock Market Participation

Financial knowledge can be defined as "an individual's knowledge and understanding of financial concepts" (Fox et al., 2005). Financial decision making is influenced by a person's level of financial knowledge since people with a low level of financial literacy are less inclined to invest in stocks and consequently are less likely to take part in the stock exchange (Van Rooij et al., 2011). Further, it has been demonstrated that the probability of partaking in the financial exchange increases if a person is financially literate (Kaustia and Torstila, 2008). Financial knowledge is decisive for creating wealth (Van Rooij et al., 2012) consider this feasible via stock market participation. Bayer et al. (2009) have concluded that financial education leads to increased participation in the stock market. Bayer et al. (2009) has concluded that financial education leads to increased participation in the stock market. Literature has affirmed the moderating role of financial knowledge in financial behaviors including stock market participation (Morrin et al., 2012; Aren and Aydemir, 2015; Hayat and Anwar, 2016; Aydemir and Aren, 2017; Hadi, 2017; Shusha, 2017).

Some studies have preferred the moderating role of financial knowledge as compared to the direct effect on risky behaviors like investment decisions (Aydemir and Aren, 2017). Other studies have indicated that there are both negative and positive moderating roles of financial knowledge on the relationship between behavioral biases and investment decisions (Hayat and Anwar, 2016). Further, financial knowledge has moderated the relationship between emotional intelligence and investment decisions (Hadi, 2017). Aren and Aydemir (2015) have concluded that financial literacy has a moderating effect on the relationship between an individual's factors and risky investment intentions. Moreover, literature has also confirmed that financial literacy moderates the relationship between demographic characteristics and financial risk tolerance (Shusha, 2017).

The researchers enhanced their argumentation by demonstrating that financially educated people face lower costs for gathering and handling information and consequently face a more moderate financial threshold for stock market participation. It has been investigated that both knowledge and attitudes may change behavior and knowledge may bring variation in attitudes and similarly it may also bring change in behavior via attitudes (Fessler et al., 2019) which indicates that for most people knowledge and attitudes may be considered as complementary rather than a substitute. Further, it has been shown that financial knowledge significantly impacts financial behavior and attitudes might have a significant role in shaping an individual's financial behaviors. Moreover, individuals with greater knowledge scores possess higher attitudes scores (Fessler et al., 2019). Aydin and Akben Selcuk (2019) concluded that individuals with higher financial knowledge show favorable economic attitudes. Financially knowledgeable individuals exhibit responsible financial behavior (Fox et al., 2005) and individuals with low financial knowledge have a lower tendency to make risky investments such as in stocks (Van Rooij et al., 2011). Literature has indicated that many individuals lack knowledge about fundamental financial concepts (Lusardi and Mitchell, 2008). Due to limited knowledge regarding investments individuals are less likely to make informed financial decisions (Chen and Volpe, 1998).

Empirical investigations have demonstrated that education, financial knowledge, and risk tolerance firmly relate to stock market participation (Cole et al., 2012). Financial literacy increases the probability of participation in the stock market (Deng, 2019). It significantly benefits the investors in helping them to minimize the entry barriers to participate in derivative markets (Yu-Jen Hsiao, 2018). The literature has shown that attitudes and knowledge significantly influence consumer's financial planning (Weisfeld-Spolter et al., 2018). Financial

knowledge has a significant positive influence on financial attitude and behavior and attitude mediates the relationship between knowledge and behavior (Fessler et al., 2019). However, there is very little research in developing economies where these variables are linked with SMP (Sivaramakrishnan et al., 2017). Van Rooij et al. (2011) concluded that financial knowledge positively impacts stock market participation, and consequently, people with low financial knowledge are less likely to take an interest in the stock exchange. These findings cause concerns since people these days increasingly need to depend on themselves regarding significant financial decisions and the financial knowledge of young people is worryingly low (Lusardi et al., 2010). Based on the literature discussion on the role of financial knowledge, it seems sensible to analyze the moderating role of financial knowledge on the relationship between money attitudes and stock market participation.

H_2: Financial knowledge moderates the relationship between money attitudes on stock market participation.

Financial Self-Efficacy and Stock Market Participation

As indicated by the social cognitive theory of self-regulation, an individual's higher self-efficacy level increases their probability of participation in a particular behavior, mostly positive monetary behavior, and makes them less inclined to feel money related pressure. Further, self-efficacy is the base of the activity of control and profoundly affects behavior (Bandura, 1991). Self-efficacy refers to an individual's ability to control, manage, and impact different parts of his or her life. In this study, financial self-efficacy is characterized as a person's perceived ability to control his/her finances. Individuals with more prominent self-efficacy over a specific conduct will generally participate in that conduct, plan higher objectives, show a constructive valuation of the job at hand, and show less dangerous pessimistic mental consequences (nervousness, stress, misery) related to adversity (Bandura, 1991, 1999). Self-efficacy must be assessed by the behavioral life domain that is under investigation (McAvay et al., 1996; Bandura, 1997).

Financial self-efficacy (FSE), a significant psychological construct, plays a significant role in shaping an individual's decision-making style during different phases of life and personal finance behavior (Farrell et al., 2016; Asebedo and Payne, 2018). It differs from person to person (Dietz et al., 2003). Financial self-efficacy has shown both mediating and moderating roles in the relationship between personality traits and investment intension (Akhtar and Das, 2019). Literature has confirmed the moderating role of financial self-efficacy in financial behaviors including stock market participation (Lim et al., 2014; Qamar et al., 2016; Faison, 2019). FSE has a positive influence on risk-taking within investment portfolios (Montford and Goldsmith, 2016). Rothwell et al. (2016) have concluded that only financial knowledge is not enough for building financial capabilities, financial self-efficacy has also significant importance. In this manner, FSE may serve a significant role in stock market participation decisions.

Individuals with greater FSE better control and deal with their financial circumstances. When the market experiences volatility, investors with greater FSE typically hold their feeling of long-term control over their monetary circumstance than investors with low FSE. Literature has shown that FSE positively affects financial practices (Shim et al., 2012; Farrell et al., 2016). Based on the evidence on the role of financial self-efficacy, there is a need to investigate whether financial self-efficacy plays a moderating role in the relationship between money attitudes and stock market participation.

H_3: Financial self-efficacy moderates the relationship between money attitudes on stock market participation.

Risk Attitudes and Stock Market Participation

According to the traditional supposition, investors differ in their levels of risk aversion and different factors likewise influence their investment decisions (Grinblatt et al., 2011). Literature has affirmed that risk attitudes have a significant influence on stock market participation decisions (Wärneryd, 1996; Tigges et al., 2000; Clark-Murphy and Soutar, 2004; Wood and Zaichkowsky, 2004; Nosić and Weber, 2010; Wanyana et al., 2011; Zhang and Li, 2011; Barasinska et al., 2012; Noussair et al., 2013). It has also been investigated that less risk aversion predicts participation in various models (Haliassos and Bertaut, 1995). Further, risk attitudes mediate the relationship between social capital and stock market participation (Cheng et al., 2018). Saurabh and Nandan (2018) have confirmed the mediating role of risk attitudes toward financial satisfaction. Barsky et al. (1997) utilized responses from hypothetical questions to anticipate real-life risky behaviors, for example holding stocks and found little impact. Generally, willingness to taking risks leads to risky behaviors (Gürdal et al., 2017). Nosić and Weber (2010) concluded that a subjective risk attitude impacts investment in shares positively as supported by Cheng et al. (2018). Conversely, Sutter et al. (2013) found that risk attitudes weakly predict field behavior (Brown et al., 2008; Gürdal et al., 2017). Akhtar and Das (2019) studied the investment intentions of investors and concluded that high-risk individuals have greater investment intentions.

Some studies have indicated that individuals who take more risks invest in stock more often than those who take fewer risks (Clark-Murphy and Soutar, 2004). Similarly, the investors who are risk-seekers tend to invest in stocks rather than bonds and those investors who play safely increasingly invest in bonds as compared to stocks (Keller and Siegrist, 2006b). The literature has shown that the individual's abilities to ensure against risks have a significant influence on their investment decisions (Heaton and Lucas, 2000; Cocco et al., 2005; Niu et al., 2020). Similarly, risk tolerance is strongly related to stock market participation (Cole et al., 2012). Similarly, happier individuals have positive attitudes toward risk and they might prefer stock market participation (Rao et al., 2016). The above literature discussions have shown mixed results that do not provide a clear understanding of the role of risk attitudes. Therefore, it seems sensible to investigate that risk attitudes may have a mediating

effect on the relationship between money attitudes (MA) and stock market participation (SMP).

H_4: Risk attitudes mediate the relationship between money attitudes on stock market participation.

RESEARCH METHODOLOGY

The sample for this study consisted of active investors from Pakistan and the data were collected from the Pakistan Stock Exchange. This study adopted the sampling method proposed by Kline (Kline, 2011). The respondents were approached personally by the researcher, and 250 valid questionnaires were received. This study utilized a convenience sampling technique to select the respondents. The reason behind using a convenience sampling method was the availability of the investors due to the fact that online trading facility investors do not visit stock exchanges regularly and perform trading from their homes. During the data collection process, the researcher visited the broker's offices in the stock exchange to get information on the investors and during investors' availability, the questionnaires were handed out. Five measurement scales were used, which included money attitudes, risk attitudes, financial knowledge, financial self-efficacy, and stock market participation. Further investors were assured that their information would be kept anonymous and data were collected from volunteer investors. Structural equation modeling (SEM) and confirmatory factor analysis (CFA) was used to check the relationships between constructs and their reliability and validity.

Money attitude was a second-order construct and consisted of four sub-dimensions, i.e., money avoidance, money worship, money status, and money vigilance, containing 49 items in the questionnaire. Klontz's money attitudes scale was used to measure the money attitudes of the investors (Klontz and Britt, 2012). **Table 1** shows the measurement items for the money attitudes scale.

The instrument for financial knowledge was adopted from research (Perry and Morris, 2005) and consisted of six items. The risk attitudes questionnaire was comprised of eight items (Zhang et al., 2019). Further, the Lown scale of financial self-efficacy was adopted to measure the financial self-efficacy of the investors (Lown, 2011), which contained six items. Finally, the stock market participation scale which had eight items included questions that were coded from 1 to 5 and were adopted from Luotonen (2009). **Table 2** shows the measurement items for the scales of financial knowledge, financial self-efficacy, risk attitudes, and stock market participation.

The money attitudes and risk attitudes were measured on a five-point Likert scale marked from "Strongly Disagree" to "Strongly Agree." The questionnaire related to financial knowledge was measured on a five-point Likert scale marked from "Nothing" to "A Lot." Similarly, the financial self-efficacy scale was measured on a five-point Likert scale marked from "Exactly True" to "Not at all True." **Table 3** shows the constructs with their items and references.

This research investigated the influence of money attitudes on stock market participation by following money attitudes and financial practices research (Klontz et al., 2011). This literature review has indicated that variables risk attitudes, financial knowledge, and financial self-efficacy have a robust link with these variables, i.e., money attitudes and stock market participation. Therefore, this study intended to check the moderating role of financial knowledge and financial self-efficacy and the mediating effect of risk attitudes on the relationship between money attitudes and stock market participation. Demographic variables cannot be ignored in this research. Literature has confirmed that socio-demographic variables significantly influence financial behaviors (Furnham, 1984; Tang and Gilbert, 1995; Korniotis and Kumar, 2011). It has been shown that women participate less in the stock market when compared to men (Van Rooij et al., 2011). Similarly, household income positively influences household saving increments (Rha et al., 2006). **Figure 1** shows the conceptual framework based on the objectives of this study and the literature review.

Descriptive statistics have explained how the data are distributed. Structural equation modeling (SEM) was run to check the influence of the predictor variable (money attitudes) on the outcome variable (stock market participation) and moderation and mediation effects. Confirmatory factor analysis was used to check the validity of the scales. The missing values and outliers were considered, and interestingly there were no missing values in the datasheet. For this study, the data were collected at the same time, which can cause common-method bias (Chang et al., 2010). Exploratory factor analysis (EFA) was performed to check the significant variance explained from the single factor to avoid common-method bias (Podsakoff and Organ, 1986). According to the result of EFA, it was found that one single factor was showing a 19.495% variance. Hence, common-method bias was not an issue. **Table 4** shows the variables and their definitions.

The convergent and discriminant validity were validated by checking the acceptable range of the AVE (average variance extracted). The value of the AVE (average variance extracted) should be greater than 0.5 to achieve the convergent validity and further, to reach the discriminant validity, the square root of the AVE was taken and placed in the diagonal to compare with the correlations of the variables. The diagonal values were more significant than the association, and in this way, discriminant validity was validated. Two measures were used, i.e., Cronbach's Alpha and construct reliability (CR) to find the reliability of the scale. To confirm the reliability of the questionnaire, the value of Cronbach's Alpha should be higher than 0.7, and the value of CR (construct reliability) should be greater than 0.6. The normality of the constructs was analyzed by using the P-P plots, which showed that the data were statistically normal. Therefore, the data were valid for the analysis purpose and met the assumption of normality.

RESULTS AND DISCUSSION

Sample Profile

The demographics presented in **Table 5** showed that the majority of investors who participated in this study were male, i.e.,

TABLE 1 | Money attitude dimension items with factor loadings.

Constructs	Measurement items	Factor loadings
Money avoidance (MA)	I do not deserve a lot of money when others have less than me.	0.649
	Rich people are greedy.	0.721
	It is not okay to have more than you need.	0.567
	People get rich by taking advantage of others.	0.547
	I do not deserve the money.	0.533
	Good people should not care about money.	0.512
	It is hard to be rich and be a good person.	0.638
	Most rich people do not deserve their money.	0.607
	There is a virtue in living with less money.	0.562
	The less money you have, the better life is.	0.573
	Money corrupts people.	0.713
	Being rich means you no longer fit in with old friends and family.	0.637
	The rich take their money for granted.	0.559
	You cannot be rich and trust what people want from you.	0.504
	It is hard to accept financial gifts from others.	0.565
Money worship (MW)	Things would get better if I had more money.	0.721
	More money will make you happier.	0.801
	There will never be enough money.	0.601
	It is hard to be poor and happy.	0.609
	You can never have enough money.	0.680
	Money is power.	0.676
	I will never be able to afford the things I really want in life.	0.614
	The money would solve all my problems.	0.658
	If you have money, someone will try to take it away from you.	0.762
	You can't trust people around money.	0.753
Money status (MS)	Most poor people do not deserve to have money.	0.555
	You can have love or money, but not both.	0.695
	I will not buy something unless it is new (e.g., car, house).	0.616
	Money is what gives life meaning.	0.654
	Your self-worth equals your net worth.	0.632
	If something is not considered the "best," it is not worth buying.	0.804
	People are only as successful as the amount of money they earn.	0.713
	It is okay to keep secrets from your partner around money.	0.554
	As long as you live a good life you will always have enough money.	0.531
	Rich people have no reason to be unhappy.	0.696
	If you are good, your financial needs will be taken care of.	0.777
	If someone asked me how much I earned, I would probably tell them I earn more than I actually do.	0.694
Money vigilance (MV)	You should not tell others how much money you have or make.	0.615
	It is wrong to ask others how much money they have or make.	0.736
	Money should be saved not spent.	0.693
	It is important to save for a rainy day.	0.721
	People should work for their money and not be given financial handouts.	0.771
	If someone asked me how much I earned, I would probably tell them I earn less than I actually do.	0.575
	You should always look for the best deal before buying something, even if it takes more time.	0.822
	If you cannot pay cash for something, you should not buy it.	0.776
	It is not polite to talk about money.	0.595
	I would be a nervous wreck if I did not have money saved for an emergency.	0.766
	It is extravagant to spend money on oneself.	0.565
	I would be embarrassed to tell someone how much money I make.	0.749

241 (96.4%) male and 9 (3.6%) female investors. The number of investors who participated was 250 in which 64 (25.6%) were in the age range 20–30, 86 (34.4%) were between the age range 31–40, 73 (29.2%) were in the age range 41–50, 17 were aged between 51 and 60, and 10 investors were at an age greater than 60.

TABLE 2 | Construct, measurement items, and factor loadings.

Constructs	Measurement items	Factor loadings
Stock market participation (SMP)	Stock markets are unpredictable, that is why I would not invest in stocks.	0.828
	I would invest a larger sum of money in stocks.	0.772
	The uncertainty of whether the markets will rise or fall keeps me from buying stocks.	0.606
	When I hear the word "stocks," the term "possible loss" comes to mind immediately.	0.743
	I am willing to take financial risks in order to substantially increase my assets.	0.721
	In money matters, I tend to be willing to take risks.	0.757
	How many types of stocks (e.g., agriculture, cement, textile sectors) do you own on average? (1) Less than 2 (2) 2–4 (3) 5–7 (4) 8–10 (5) More than 10	0.768
	How much is your total investment in stock market annually? (1) Less than 100,000 (2) 100,000–300,000 (3) 300,000–500,000 (4) 500,000–700,000 (5) More than 700,000	0.599
Risk attitudes (RA)	Taking risks makes life more fun.	0.688
	My friends would say that I am a risk taker.	0.701
	I enjoy taking risks in most aspects of my life.	0.720
	I would take a risk even if it meant I might get hurt.	0.876
	Taking risks is an important part of my life.	0.694
	I commonly make risky decisions.	0.681
	I am a believer of taking chances.	0.862
	I am attracted, rather than scared, by risk.	0.554
Financial self-efficacy (FSE)	It is hard to stick to my spending plan when unexpected expenses arise.	0.771
	It is challenging to make progress toward my financial goals.	0.850
	When unexpected expenses occur, I usually have to use credit.	0.669
	When faced with a financial challenge, I have a hard time figuring out a solution.	0.706
	I lack confidence in my ability to manage my finances.	0.588
	I worry about running out of money in retirement.	0.760
Financial knowledge (FK)	Interest rates, finance charges and credit terms.	0.810
	Managing finances	0.815
	Investing money	0.624
	Debt card, credit card, cheque book, taxes.	0.622
	Common stocks, preferred shares, bonds, govt. securities	0.525
	Stock exchanges, mutual funds, insurance companies, microfinance institutions.	0.777

TABLE 3 | Variables and scales.

Variables	No. of items	References
Financial knowledge	6	Perry and Morris, 2005
Money attitudes	49	Klontz et al., 2011
Financial self-efficacy	6	Lown, 2011
Risk attitudes	8	Zhang et al., 2019
Stock market participation	8	Luotonen, 2009

The majority of investors who participated in this research were between the ages of 31–40. Most of the investors were from urban backgrounds (220, 88.0%), while 30 (12.0%) investors were from rural backgrounds. Further, 115 (46.0%) investors had a master's degree, while only three investors (1.2%) were educated to a Matric level. Forty-one investors (16.4%) had an intermediate education, 87 (34.8%) had a Bachelor's degree, and four investors (1.6%) had an education level greater than MS. The monthly income of 106 (42.4%) of the investors was less than Rs. 40,000, 103 (41.2%) investors had a monthly income of between 41,000 and 80,000, 19 (7.6%) were between 81,000 and 120,000, 8 (3.2%) were between 121,000 and 160,000, and 14 (5.6%) investors had a monthly income greater than 160,000.

Statistical Analysis

The statistical analysis of research models was performed through SPSS 22 and AMOS 26. Structural equation modeling (SEM) was applied using AMOS 26, and the effect of predictor, moderator, and mediator on the dependent variable was analyzed. Structural equation modeling (SEM) is useful when there are higher numbers of variables in the model, and it includes latent variables into the study and also calculates the measurement error (Hair et al., 2011).

Confirmatory Factor Analysis (CFA), Reliability, and Validity

Confirmatory factor analysis (CFA) was applied to conform to the standards of convergent validity and discriminant validity of the constructs. Further, for testing the goodness of fit statistics model fit indices were chosen. The initial results of CFA showed the goodness of fit index (GFI) value as 0.967, which was higher than the required value, i.e., 0.90. The adjusted goodness of fit index (AGFI) value was 0.924,

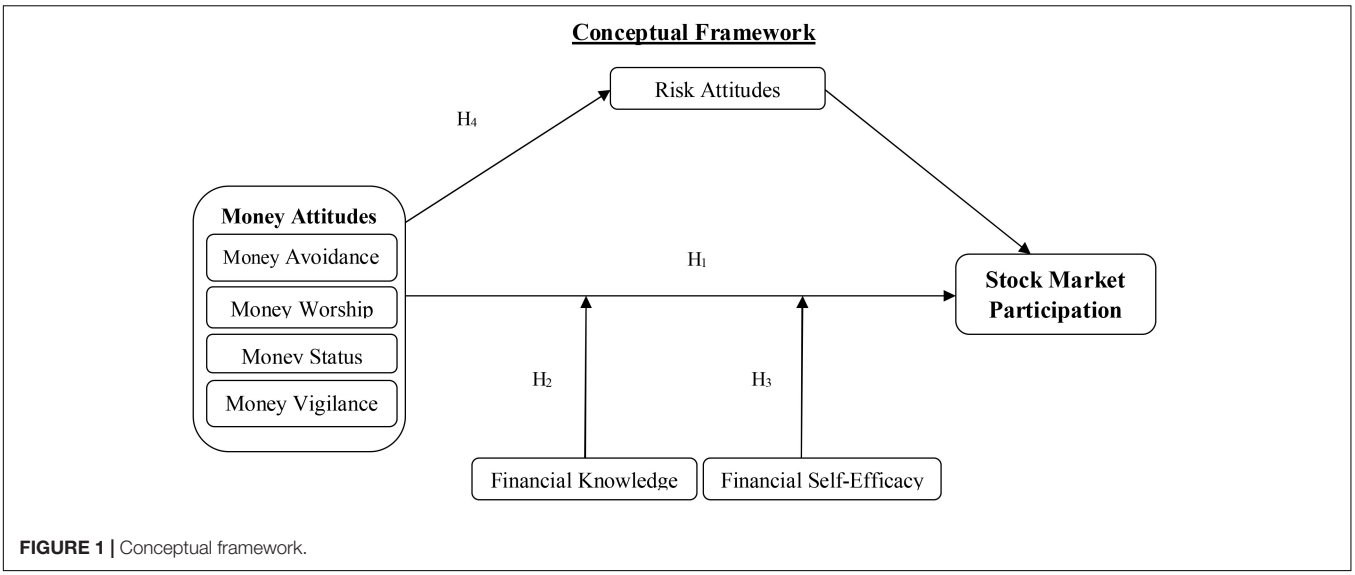

FIGURE 1 | Conceptual framework.

TABLE 4 | Definitions of variables.

Sr. #	Variable name	Variable definition
1.	Money attitudes	People's attitudes which portray behavior in money matters. People build up an attitude toward money on the premise of circumstances and experiences that one encounters over a lifetime.
2.	Money avoidance	Believing that money is bad, that wealthy individuals are greedy, and that they don't deserve money. Individuals may avoid spending money on even sensible or essential purchases.
3.	Money worship	Individuals with this characteristic are convinced that more cash will solve the majority of their issues, that there will never be a sufficient amount, and that cash brings power and happiness.
4.	Money status	People who trust that money is status see a clear distinction between socio-economic classes. Status lovers believe that owning the best and most current things gives status.
5.	Money vigilance	For some individuals, money is a profound source of shame and mystery, whether one has a lot or a little. The money vigilance element appears to be connected to alertness, readiness, watchfulness, and worry about money, and the feeling that one must be aware of pending inconvenience or threat.
6.	Financial self-efficacy	Financial self-efficacy is characterized as a man's perceived ability to control his/her finance.
7.	Financial knowledge	Financial knowledge is understanding critical financial terms and ideas needed to function day by day in society.
8.	Risk attitudes	Risk attitudes are an individual's attitudes toward risk-taking and consist of two types, i.e., risk aversion and risk-seeker. Risk aversion is the behavior of humans who, when exposed to uncertainty, attempt to lower that uncertainty. A risk-seeker or risk-lover is a person who prefers risk.

for the Tucker-Lewis index (TLI), the value was 0.964, for the comparative fit index (CFI) the value was 0.981, for the incremental fit index (IFI) the value was 0.981. The values of all these fitness indices was higher than 0.90, which is the required level. The value of RMSEA (root mean square error approximation) was 0.060, which was also in an acceptable range. Further, the value of R^2 was 0.43, which showed that the predictor variable (money attitudes) brought a 43% variance in the outcome variable (stock market participation). The convergent and discriminant validity were validated by checking the acceptable range of the AVE (average variance extracted). **Table 6** shows the results of CFA and reliability analysis.

To validate the convergent validity, the value of the AVE should be greater than 0.5 (Hair et al., 1998). For achieving the discriminant validity, the square root of the AVE was taken and placed in the diagonal to compare with the Pearson correlations of the variables and the correlations were less than 0.80 (Brown, 2015). Therefore, all the variables were fine for convergent and discriminant validity. Cronbach's Alpha and construct reliability were used to find the reliability of the scale. The value of Cronbach's Alpha should be greater than 0.7 for a reliable dataset (Hair et al., 1998). Construct reliability was measured through composite reliability which should be greater than 0.6 (Bagozzi et al., 1998). For discriminant validity, the square root of the AVE should be higher than the correlations of each construct (Chin et al., 1997). Therefore, **Table 7** validates discriminant validity.

Structural Model; Goodness of Fit Statistics

After ensuring the validity and reliability of the variables, the established relationships in the conceptual framework were tested (**Figure 1**). In the conceptual framework, the construct of money attitudes was a second-order construct and consisted of

TABLE 5 | Descriptive statistics of the variables.

Variables	Definitions and frequency		Percent	Mean	SD
Gender	1 = Male	241	96.4	0.96	0.187
	0 = Female	9	3.6		
Age	1 = 20–30	64	25.6		
	2 = 31–40	86	34.4	2.29	1.048
	3 = 41–50	73	29.2		
	4 = 51–60	17	6.8		
	5 = 60	10	4.0		
	Total	250			
Residential area	1 = Urban	220	88.0		
	2 = Rural	30	12.0	1.12	0.326
	Total	250			
Education	1 = Matric	3	1.2		
	2 = Intermediate	41	16.4	3.30	0.804
	3 = Bachelor	87	34.8		
	4 = Master	115	46.0		
	5 = MS	4	1.6		
	Total	250			
Monthly income	1 = 40,000	106	42.4		
	2 = 41,000–80,000	103	41.2	1.88	1.060
	3 = 81,000–120,000	19	7.6		
	4 = 121,000–160,000	8	3.2		
	5 = 160,000	14	5.6		
	Total	25			

Source: Authors calculations.

four dimensions, i.e., money avoidance, money worship, money status, and money vigilance. First of all, through these four dimensions, the second-order construct money attitudes was measured, and then the impact of money attitudes on stock market participation was analyzed. The modification indices were also analyzed for improving model fitness (Anderson and Gerbing, 1988). Most commonly used fit indices were used for the goodness of fit statistics (**Table 8**). The structural equation modeling (SEM) results showed that the structural model was fit, and that money attitudes brought a 43% variance in stock market participation of the investors (adjusted R^2 = 0.43, i.e., 43%) (**Table 8**). **Figure 2** shows the structural model using AMOS 26.

The results of the first hypothesis showed that money attitudes (MA) (β = 0.833, þ = 0.000) have a strong significant positive impact on the stock market participation (SMP) of the investors, and hence hypothesis H1 was supported. Therefore, this research shows the significance of money attitudes of investors in predicting stock market participation which means that the investors are more concerned about their money attitudes while deciding whether to participate in the stock market or not.

Moderation Analysis

The moderation was tested in AMOS 26 by constructing a structured diagram. First of all, the independent variable money attitude and two moderating variables, i.e., financial knowledge and financial self-efficacy were standardized, and after these two interaction terms were computed using SPSS 22. The first interaction term (FK_X_Money_Attitudes) was calculated by multiplying the z-score of financial knowledge (FK) and money attitudes (MA). After computing the interaction term, it was entered into the model with the independent and dependent variables (**Figure 2**). The moderation model having a standardized effect of the interaction term, i.e., FK_X_Money_Attitudes (β = 0.219, þ = 0.007) with stock market participation, showed that financial knowledge positively moderated the relationship between money attitudes and stock market participation. It shows that higher financial knowledge strengthens this relationship, and more financially literate investors have greater stock market participation.

The second interaction term (FSE_X_Money_Attitudes) was computed by multiplying the z-score of financial self-efficacy and money attitudes. Further, the standardized effect of the interaction term, i.e., FSE_X_Money_Attitudes (β = 0.198, þ = 0.006) with stock market participation showed that financial self-efficacy also positively moderates the relationship between money attitudes and stock market participation. This finding has indicated that individuals with substantial control over their financial abilities are more likely to invest in the stock market. Therefore, financial knowledge and financial self-efficacy both strengthen the positive relationship between money attitudes and stock market participation in investors (**Figure 2**). Consequently, the hypotheses H_2 and H_3 were supported.

Mediation Analysis

For testing the mediating role of risk attitudes, two approaches were used, i.e., Baron and Kenny (1986) and Hoyle and Smith (1994). First of all, the direct path between money attitudes and stock market participation was drawn, and the relationship between the predictor and the dependent variable was tested. After this, an indirect path was drawn as money attitudes-risk attitudes-stock market participation, and the mediating role of risk attitudes was analyzed. The direct path from money attitudes to stock market participation showed that money attitudes exerted a positive impact on stock market participation (β = 0.833, þ = 0.000). When the risk attitude was taken as a mediating variable, it showed partial mediation between the relationship of money attitudes and stock market participation (β = 0.096, þ = 0.046). Thus, risk attitudes partially mediate the relationship between money attitudes and stock market participation. This finding indicates that the individuals who are high risk-takers have a higher probability of participating in the stock market as supported by Akhtar and Das (2019). Hence hypothesis H_4 was also supported.

DISCUSSION AND IMPLICATIONS

As with many types of research carried out internationally, this study intended to identify the influence of investor's money attitudes in their stock market participation decisions by collecting primary data to test the hypotheses. Based on data collected from investors and through structural equation

TABLE 6 | Confirmatory factor analysis and reliability.

Constructs	Items with standard factor loadings		KMO	CR	Cronbach's alpha	AVE
Money avoidance (MA)	MA1 = 0.649	MA9 = 0.562	0.855	0.89	0.866	0.59
	MA2 = 0.721	MA10 = 0.573				
	MA3 = 0.567	MA11 = 0.713				
	MA4 = 0.547	MA12 = 0.637				
	MA5 = 0.533	MA13 = 0.559				
	MA6 = 0.512	MA14 = 0.504				
	MA7 = 0.638	MA15 = 0.565				
	MA8 = 0.607					
Money worship (MW)	MW1 = 0.721	MW6 = 0.676	0.777	0.90	0.768	0.69
	MW2 = 0.801	MW7 = 0.614				
	MW3 = 0.601	MW8 = 0.658				
	MW4 = 0.609	MW9 = 0.762				
	MW5 = 0.680	MW10 = 0.753				
Money status (MS)	MS1 = 0.555	MS7 = 0.713	0.822	0.90	0.825	0.66
	MS2 = 0.695	MS8 = 0.554				
	MS3 = 0.616	MS9 = 0.531				
	MS4 = 0.654	MS10 = 0.696				
	MS5 = 0.632	MS11 = 0.777				
	MS6 = 0.804	MS12 = 0.694				
Money vigilance (MV)	MV1 = 0.615	MV7 = 0.822	0.729	0.92	0.780	0.70
	MV2 = 0.736	MV8 = 0.776				
	MV3 = 0.693	MV9 = 0.595				
	MV4 = 0.721	MV10 = 0.766				
	MV5 = 0.771	MV11 = 0.565				
	MV6 = 0.575	MV12 = 0.749				
Stock market participation (SMP)	SMP1 = 0.828	SMP5 = 0.721	0.774	0.90	0.742	0.72
	SMP2 = 0.772	SMP6 = 0.757				
	SMP3 = 0.606	SMP7 = 0.768				
	SMP4 = 0.743	SMP8 = 0.599				
Risk attitudes (RA)	RA1 = 0.688	RA5 = 0.694	0.801	0.89	0.845	0.72
	RA2 = 0.701	RA6 = 0.681				
	RA3 = 0.720	RA7 = 0.862				
	RA4 = 0.876	RA8 = 0.554				
Financial self-efficacy (FSE)	FSE1 = 0.771	FSE4 = 0.706	0.651	0.87	0.596	0.72
	FSE2 = 0.850	FSE5 = 0.588				
	FSE3 = 0.669	FSE6 = 0.760				
Financial knowledge (FK)	FK1 = 0.810	FK4 = 0.622	0.732	0.85	0.664	0.70
	FK2 = 0.815	FK5 = 0.525				
	FK3 = 0.624	FK6 = 0.777				

Source: Authors calculations. KMO, Kaiser-Meyer-Olkin; AVE, average variance extracted.

TABLE 7 | Discriminant validity and correlations.

Constructs	Money avoidance	Money worship	Money status	Money vigilance	Stock market participation	Risk attitudes	Financial self-efficacy	Financial knowledge
Money avoidance	**0.74**							
Money worship	0.67**	**0.83**						
Money status	0.66**	0.67**	**0.81**					
Money vigilance	0.54**	0.56**	0.64**	**0.84**				
Stock market participation	0.50**	0.40**	0.55**	0.47**	**0.85**			
Risk attitudes	0.42**	0.30**	0.50**	0.47**	0.36**	**0.85**		
Financial self-efficacy	0.33**	0.35**	0.38**	0.31**	0.41**	0.36**	**0.85**	
Financial knowledge	0.39**	0.40**	0.31**	0.45**	0.52**	0.43**	0.39**	**0.83**
Mean	3.23	3.38	3.23	3.49	3.35	3.50	4.26	4.17
SD	0.68	0.65	0.64	0.52	0.83	0.67	0.65	0.85

*Source: Authors calculations. The values in the diagonal are the square root of the AVE, and the off-diagonal values are the correlations among variables. The discriminant validity is achieved when the diagonal values are higher than the off-diagonal values. **Correlation is significant at 0.01 level (2-tailed). Bold values are the values in the diagonal are the square root of the AVE.*

modeling (SEM), this study has found that money attitudes were significant in predicting stock market participation of the individual investors (β = 0.833) supported by Furnham (1984); Wood and Zaichkowsky (2004), Keller and Siegrist (2006a), and Klontz et al. (2011). Support has been found from the theory of planned behavior (TPB) that individual's attitudes have a strong influence on their behaviors (Ajzen, 1985). The results indicate that investors consider their attitudes toward money very important while participating in the stock market as supported by O'Connor and White (2010) and Schmidt (2010). Investor groups having distinct money attitude types that invest in different financial assets (Wood and Zaichkowsky, 2004). Further, findings have shown that women participate less in the stock market as compared to men as supported by Van Rooij et al. (2011). Following past literature, financial knowledge has been found to have a significant influence on stock market participation decisions of investors (Van Rooij et al., 2011) and positively moderate the relationship between money attitudes and stock market participation (β = 0.219) as supported by Aren and Aydemir (2015); Hadi (2017), and Shusha (2017). This shows that more financially literate investors have greater stock market participation as supported by Parrotta and Johnson (1998) and Perry and Morris (2005). The reason could be that when the investors have sufficient financial knowledge related to the stock market, industries, share, and bonds they are capable of making sound financial decisions, and similarly their stock market participation increases. Previous studies have shown both negative and positive moderating roles in financial knowledge (Hayat and Anwar, 2016) and some studies have preferred the moderating role of financial knowledge as compared to direct effects (Aydemir and Aren, 2017). This research has supported the findings of previous studies which have shown that financially knowledgeable individuals show responsible financial behavior and individuals with low financial knowledge have a lower tendency to make risky investments such as in stocks (Fox et al., 2005; Van Rooij et al., 2011).

TABLE 8 | Model fit statistics.

Goodness of fit indices	Structural model (conceptual framework)	Norms	References
X2	45.715	NA	
X2/df	1.905	>1 and <5	
GFI	0.967	≥0.90	Shevlin and Miles, 1998
AGFI	0.924	≥0.90	
TLI	0.964	≥0.90	Hu and Bentler, 1999
CFI	0.981	≥0.90	Hu and Bentler, 1999
RMSEA	0.060	≥0.05	MacCallum et al., 1996
IFI	0.981	≥0.90	Bagozzi and Yi, 1988
R^2 Adjusted (SMP)	0.43		

Source: Authors calculations.

The results have shown that financial self-efficacy moderates the relationship between money attitudes and stock market participation as supported by Lim et al. (2014); Faison (2019), and Wang (2019). It indicates that the investors who have greater control over their finances substantially

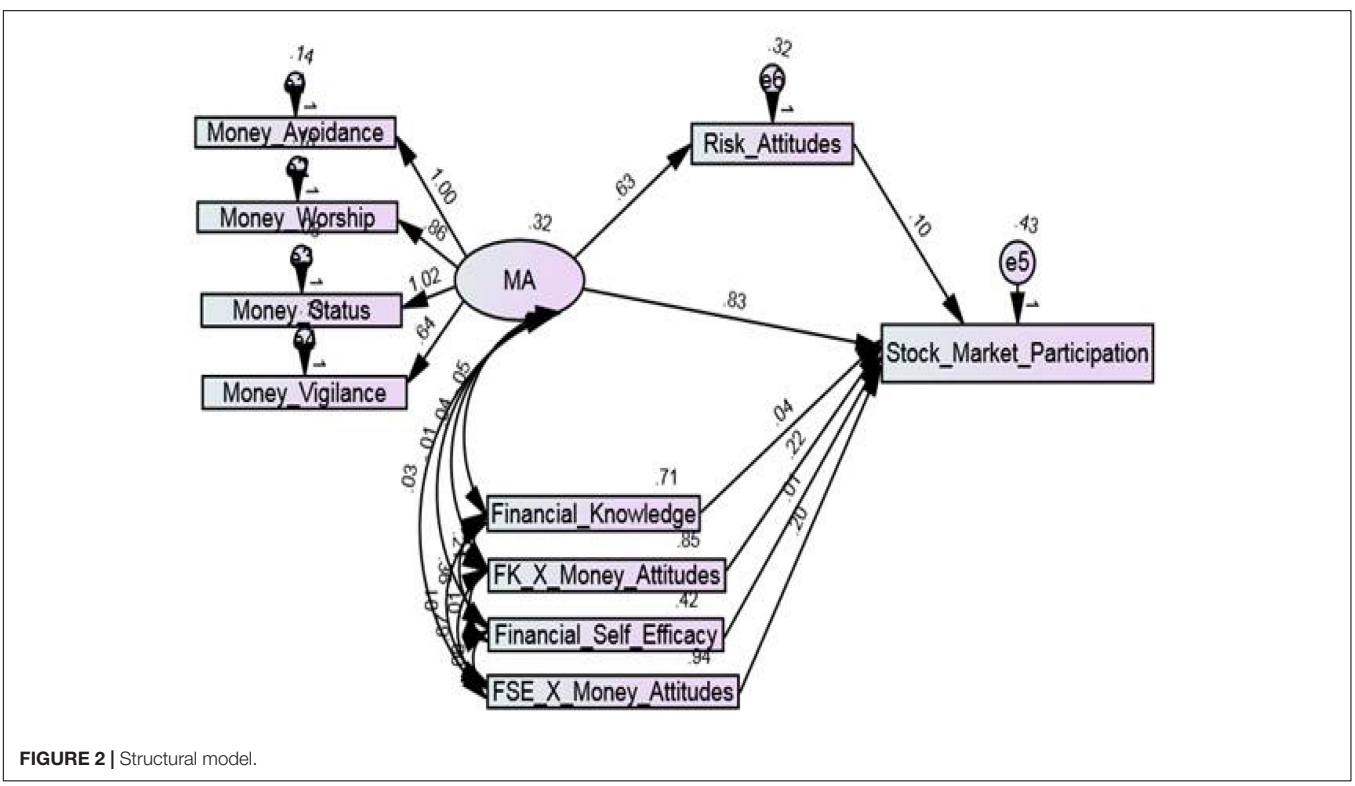

FIGURE 2 | Structural model.

participate in stock market activities as they trust in their financial capabilities (Wang, 2019). This shows that when the market experiences volatility, investors with greater FSE will typically hold their feeling of long-term control over their monetary circumstance than investors with low FSE. Therefore, financial self-efficacy, a significant psychological construct, can play a significant role in shaping an individual's decision-making style during different phases of life especially in personal finance behaviors as supported by Farrell et al. (2016) and Asebedo and Payne (2018). Further, risk attitudes have partially mediated the relationship between money attitudes and stock market participation as supported by Cheng et al. (2018) and Saurabh and Nandan (2018). These results support the previous studies findings (Wood and Zaichkowsky, 2004) and indicate that the investors who are risk-seekers increasingly participate in the stock market as supported by Cheng et al. (2018) and Akhtar and Das (2019). It indicates that the investors who are risk-seekers tend to invest in stocks rather than bonds and those investors who play it safe increasingly invest in bonds as compared to stocks as supported by Keller and Siegrist (2006b). Further, an individual's ability to ensure against risks significantly influences investment decisions (Cocco et al., 2005; Niu et al., 2020).

Practical Implications

This research will help financial professionals, economic institutions, and policy makers to make better strategies and make financial decisions related to the stock market. This study has shown the importance of money attitudes of investors in their financial decisions related to stock market participation. Further, the important role of the variables financial knowledge, financial self-efficacy, and risk attitudes have been identified in this relationship. This study can benefit governments and stock market professionals who need to know about the important influence of money attitudes of investors in their investment decisions. More focus could be given to those factors that shape these money attitudes. It can help to better understand stock market participation and the parameters impacting an individual's decisions whether or not to participate in the stock market. This study can also help in understanding that investment attitudes are essential for differentiating beginner investors who have not had investment experience yet, thus have not built behavior related to investment strategies. Further, this study has briefly explained the importance of variables like financial knowledge, financial self-efficacy, and risk attitudes which can also be focused by financial professionals in analyzing the investment behavior of the investors.

Theoretical Implications

This study will add to the existing knowledge on the attitude and behavior relationship, as in previous studies the attitudes have been studied in a broader perspective and there is little research on the subtypes of attitudes like money attitudes and risk attitudes, especially in relation with stock market participation. This study has shown the importance of the money attitudes of investors and also their strong influence in their stock market participation decisions. A comprehensive set of traits clarifies the level of investments using stock market participation; money attitudes can take a predominant role. Further, attitudes anticipate behavior effectively just when there is a high correspondence between the attitude object and the behavioral option. Moreover, this study will add to the literature on the moderating role of financial knowledge and financial self-efficacy and the mediating role of risk attitudes on the relationship between money attitudes and stock market participation. This study has used the theory of planned behavior to investigate the attitude and behavior relationship, which has provided proof of the validity of the TPB. Specifically, this research broadens the thought of monetary intelligence through its investigation of the degree to which investors adopt their money attitudes to "frame" the effects of the stock exchange.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This research is an attempt to better understand why and when investors decide to participate in the stock market and whether their participation decisions are differentiated by their risk attitudes, financial knowledge, and financial self-efficacy. This study has provided evidence that investor's stock market participation decisions are influenced by distinct psychological factors like money attitudes, risk attitudes, and financial self-efficacy. This research is of great interest because it intends to describe not only the importance of money attitudes in stock market participation decisions but also to clarify the influence of other variables that mostly go unnoticed. From one perspective, the study fills the research gap present in previous studies that have not highlighted the psychological aspect of money attitudes for participation in the stock market. Further, this research explains the vital influence of intangible assets, for instance, risk attitudes and financial self-efficacy and resources, for example, financial knowledge importance for participating in the stock market.

Although this research contributes to existing knowledge, it has some limitations. Firstly, the sample size for this research was limited to 250 active investors, and the reason for this sample size was the availability of online access for trading. Due to online trading access, the investors are less likely to visit the stock market as they can trade from their respective locations. Therefore the sample size can be increased for a more in-depth understanding of these relationships in future studies. Secondly, this study has specifically focused on money attitudes as compared to previous studies which broadly studied attitudes, indicating the research gap. Hence, other subtypes of attitudes can also be considered in future studies. Other suggestions include finding the influence of socio-demographics in this relationship, comparative study explaining the differences among attitudes in different countries, and taking other moderating and mediating variables to enhance the predictive power of the model.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any qualified researcher.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of the Department of Management Sciences, COMSATS University Islamabad Lahore Campus, Pakistan. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MAN, MQ, MSN, and IA contributed to writing the original draft of the manuscript, making revisions and reformulation of main theme of the manuscript. KS and AT helped in data collection at first and second stage. All authors contributed to the article and approved the submitted version.

REFERENCES

Adam, A. A., and Shauki, E. R. (2014). Socially responsible investment in Malaysia: behavioural framework in evaluating investors' decision making process. *J. Clean. Product.* 80, 224–240. doi: 10.1016/j.jclepro.2014.05.075

Ajzen, I. (1985). "From intentions to actions: a theory of planned behaviour Action control," in *Action Control. SSSP Springer Series in Social Psychology*, eds J. Kuhl and J. Beckmann (Berlin: Springer), 11–39. doi: 10.1007/978-3-642-69746-3_2

Ajzen, I. (1991). The theory of planned behaviour. *Organ. Behav. Hum. Decis. Process.* 50, 179–211.

Ajzen, I., and Driver, B. L. (1992). Application of the theory of planned behaviour to leisure choice. *J. Leisure Res.* 24, 207–224. doi: 10.1080/00222216.1992.11969889

Ajzen, I., and Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behaviour*. Upper Saddle River, NJ: Prentice-Hall.

Akhtar, F., and Das, N. (2019). Predictors of investment intention in Indian stock markets: extending the theory of planned behaviour. *Intern. J. Bank Mark.* 37, 97–119. doi: 10.1108/ijbm-08-2017-0167

Almenberg, J., and Dreber, A. (2015). Gender, stock market participation and financial literacy. *Econ. Lett.* 137, 140–142. doi: 10.1016/j.econlet.2015.10.009

Anderson, J. C., and Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychol. Bull.* 103:411. doi: 10.1037/0033-2909.103.3.411

Aren, S., and Aydemir, S. D. (2015). The moderation of financial literacy on the relationship between individual factors and risky investment intention. *Intern. Bus. Res.* 8:17.

Arrondel, L., Debbich, M., and Savignac, F. (2015). Stockholding in France: the role of financial literacy and information. *Appl. Econ. Lett.* 22, 1315–1319. doi: 10.1080/13504851.2015.1026578

Arts, L. (2018). Financial Literacy and Stock Market Participation: The Moderating Effect of Country-Specific Social Connectedness. Available online at: http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1193563&dswid=-7522 (accessed March 1, 2020).

Asebedo, S., and Payne, P. (2018). Market volatility and financial satisfaction: the role of financial self-efficacy. *J. Behav. Finance* 20, 42–52. doi: 10.1080/15427560.2018.1434655

Aydemir, S. D., and Aren, S. (2017). Do the effects of individual factors on financial risk-taking behaviour diversify with financial literacy? *Kybernetes* 46, 1706–1734. doi: 10.1108/k-10-2016-0281

Aydin, A. E., and Akben Selcuk, E. (2019). An investigation of financial literacy, money ethics and time preferences among college students: a structural equation model. *Intern. J. Bank Market.* 37, 880–900. doi: 10.1108/ijbm-05-2018-0120

Bagozzi, R. P., and Yi, Y. (1988). On the evaluation of structural equation models. *J. Acad. Market. Sci.* 16, 74–94.

Bagozzi, R. P., Yi, Y., and Nassen, K. D. (1998). Representation of measurement error in marketing variables: review of approaches and extension to three-facet designs. *J. Econometr.* 89, 393–421. doi: 10.1016/s0304-4076(98)00068-2

Balloch, A., Nicolae, A., and Philip, D. (2014). Stock market literacy, trust, and participation. *Rev. Finance* 19, 1925–1963.

Balloch, A., Nicolae, A., and Philip, D. (2015). Stock market literacy, trust, and participation. *Rev. Finance* 19, 1925–1963. doi: 10.1093/rof/rfu040

Bamforth, J., Jebarajakirthy, C., and Geursen, G. (2018). Understanding undergraduates' money management behaviour: a study beyond financial literacy. *Intern. J. Bank Mark.* 36, 1285–1310. doi: 10.1108/ijbm-05-2017-0104

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organ. Behav. Hum. Decis. Process.* 50, 248–287. doi: 10.1016/0749-5978(91)90022-l

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York, NY: WH Freeman.

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Pers. Soc. Psychol. Rev.* 3, 193–209. doi: 10.4324/9781315799292-3

Barasinska, N., Schäfer, D., and Stephan, A. (2012). Individual risk attitudes and the composition of financial portfolios: evidence from German household portfolios. *Q. Rev. Econ. Finance* 52, 1–14. doi: 10.1016/j.qref.2011.10.001

Barber, B. M., and Odean, T. (2013). "The behaviour of individual investors," in *Handbook of the Economics of Finance*, eds G. M. Constantinides, M. Harris and R. M. Stulz (Amsterdam: Elsevier), Vol. 2 (Part B), 1533–1570. doi: 10.1016/b978-0-44-459406-8.00022-6

Baron, R. M., and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51:1173. doi: 10.1037/0022-3514.51.6.1173

Barsky, R. B., Juster, F. T., Kimball, M. S., and Shapiro, M. D. (1997). Preference parameters and behavioural heterogeneity: an experimental approach in the health and retirement study. *Q. J. Econ.* 112, 537–579. doi: 10.1162/003355397555280

Bayer, P. J., Bernheim, B. D., and Scholz, J. K. (2009). The effects of financial education in the workplace: evidence from a survey of employers. *Econ. Inq.* 47, 605–624. doi: 10.1111/j.1465-7295.2008.00156.x

Belsky, G., and Gilovich, T. (1999). *Why Smart People Make Big Mistakes-and How to Correct Them: Lessons from the New Science of Behavioural Economics*. New York, NY: Simon & Schuster.

Bonaparte, Y., Korniotis, G. M., and Kumar, A. (2014). Income hedging and portfolio decisions. *J. Finance Econ.* 113, 300–324. doi: 10.1016/j.jfineco.2014.05.001

Bonaparte, Y., and Kumar, A. (2013). Political activism, information costs, and stock market participation. *J. Finance Econ.* 107, 760–786. doi: 10.1016/j.jfineco.2012.09.012

Brown, J. R., Ivkoviæ, Z., Smith, P. A., and Weisbenner, S. (2008). Neighbors matter: causal community effects and stock market participation. *J. Finance* 63, 1509–1531. doi: 10.1111/j.1540-6261.2008.01364.x

Brown, T. A. (2015). *Methodology in the Social Sciences: Confirmatory Factor Analysis for Applied Research*, 2nd Edn, New York, NY: Guilford Press.

Calvet, L., Célérier, C., Sodini, P., and Vallée, B. (2016). Financial innovation and stock market participation. *Working Paper # DR16-01*, Canada: Canadian Derivative Institute.

Calvet, L. E., and Sodini, P. (2014). Twin picks: disentangling the determinants of risk-taking in household portfolios. *J. Finance* 69, 867–906. doi: 10.1111/jofi.12125

Campbell, J. Y. (2006). Household finance. *J. Finance* 61, 1553–1604.

Canova, L., Rattazzi, A. M. M., and Webley, P. (2005). The hierarchical structure of saving motives. *J. Econ. Psychol.* 26, 21–34. doi: 10.1016/j.joep.2003.08.007

Chang, S.-J., Van Witteloostuijn, A., and Eden, L. (2010). From the editors: common method variance in international business research. *J. Intern. Bus. Stud.* 41, 178–184. doi: 10.1057/jibs.2009.88

Chang, Y. C. R., and Hanna, S. (1992). Consumer credit search behaviour. *J. Consum. Stud. Home Econ.* 16, 207–227. doi: 10.1111/j.1470-6431.1992.tb00513.x

Chen, H., and Volpe, R. P. (1998). An analysis of personal financial literacy among college students. *Financial Serv. Rev.* 7, 107–128. doi: 10.1016/s1057-0810(99)80006-7

Cheng, Y.-F., Mutuc, E. B., Tsai, F.-S., Lu, K.-H., and Lin, C.-H. (2018). Social capital and stock market participation via technologies: the role of households' risk attitude and cognitive ability. *Sustainability* 10:1904. doi: 10.3390/su10061904

Chin, W. W., Gopal, A., and Salisbury, W. D. (1997). Advancing the theory of adaptive structuration: the development of a scale to measure faithfulness of appropriation. *Inform. Syst. Res.* 8, 342–367. doi: 10.1287/isre.8.4.342

Christelis, D., Jappelli, T., and Padula, M. (2010). Cognitive abilities and portfolio choice. *Eur. Econ. Rev.* 54, 18–38. doi: 10.1016/j.euroecorev.2009.04.001

Clark-Murphy, M., and Soutar, G. N. (2004). What individual investors value: some Australian evidence. *J. Econ. Psychol.* 25, 539–555. doi: 10.1016/s0167-4870(03)00056-4

Cocco, J. F., Gomes, F. J., and Maenhout, P. J. (2005). Consumption and portfolio choice over the life cycle. *Rev. Financial Stud.* 18, 491–533. doi: 10.1093/rfs/hhi017

Cole, S. A., Paulson, A. L., and Shastry, G. K. (2012). *Smart Money: The Effect of Education on Financial Behaviour. Harvard Business School Finance Working Paper*. Available online at: http://academics.wellesley.edu/Economics/gshastry/cole-paulson-shastry-financial%20behavior.pdf (accessed March 1, 2020).

Cole, S. A., and Shastry, G. K. (2009). *Smart Money: The Effect of Education, Cognitive Ability, and Financial Literacy on Financial Market Participation*. Boston, MA: Harvard Business School.

Conlin, A., Kyröläinen, P., Kaakinen, M., Järvelin, M.-R., Perttunen, J., and Svento, R. (2015). Personality traits and stock market participation. *J. Empir. Finance* 33, 34–50. doi: 10.1016/j.jempfin.2015.06.001

Dam, R. M. M. L. (2017). Role of an attitude and financial literacy in stock market participation. *Intern. J. Manag. IT Eng.* 7, 137–149.

Daniel, K., Hirshleifer, D., and Teoh, S. H. (2002). Investor psychology in capital markets: evidence and policy implications. *J. Monet. Econ.* 49, 139–209. doi: 10.1016/s0304-3932(01)00091-5

Deng, J. Z. X. (2019). Financial literacy, housing value and household financial market participation: evidence from urban China. *China Econ. Rev.* 55, 52–66. doi: 10.1016/j.chieco.2019.03.008

Dietz, B. E., Carrozza, M., and Ritchey, P. N. (2003). Does financial self-efficacy explain gender differences in retirement saving strategies? *J. Women Aging* 15, 83–96. doi: 10.1300/j074v15n04_07

Dimmock, S. G., and Kouwenberg, R. (2010). Loss-aversion and household portfolio choice. *J. Empir. Finance* 17, 441–459. doi: 10.1016/j.jempfin.2009.11.005

Dowling, N., Tim, C., and Hoiles, L. (2009). Financial management practices and money attitudes as determinants of financial problems and dissatisfaction in young male Australian workers. *J. Financial Counsel. Plan.* 20:9.

Faison, A. D. (2019). *Financial Knowledge is Power: Exploring the Protective Benefits of Financial Self-Efficacy Among Young Adults*. Phoenix, AZ: Arizona State University.

Falahati, L., and Paim, L. H. (2011). Gender differences in financial well-being, financial socialization and financial knowledge among college students. *Life Sci. J. Acta* 8, 173–178.

Farrell, L., Fry, T. R., and Risse, L. (2016). The significance of financial self-efficacy in explaining women's personal finance behaviour. *J. Econ. Psychol.* 54, 85–99. doi: 10.1016/j.joep.2015.07.001

Fessler, P., Silgoner, M., and Weber, R. (2019). Financial knowledge, attitude and behaviour: evidence from the Austrian survey of financial literacy. *Empirica* doi: 10.4324/9780429431968-3

Fox, J., Bartholomae, S., and Lee, J. (2005). Building the case for financial education. *J. Consum. Affairs* 39, 195–214. doi: 10.1111/j.1745-6606.2005.00009.x

Fox, J. J., and Bartholomae, S. (2008). "Financial education and program evaluation," in *Handbook of Consumer Finance Research*, ed. J. J. Xiao (Cham: Springer), 47–68. doi: 10.1007/978-0-387-75734-6_4

Furnham, A. (1984). Many sides of the coin: the psychology of money usage. *Pers. Individ. Differ.* 5, 501–509. doi: 10.1016/0191-8869(84)90025-4

Gambetti, E., and Giusberti, F. (2012). The effect of anger and anxiety traits on investment decisions. *J. Econ. Psychol.* 33, 1059–1069. doi: 10.1016/j.joep.2012.07.001

Gao, M. (2015). Demographics, family/social interaction, and household finance. *Econ. Lett.* 136, 194–196. doi: 10.1016/j.econlet.2015.09.027

Gao, M., Meng, J., and Zhao, L. (2019). Income and social communication: the demographics of stock market participation. *World Econ.* 42, 2244–2277. doi: 10.1111/twec.12777

Georgarakos, D., and Pasini, G. (2011). Trust, sociability, and stock market participation. *Rev. Finance* 15, 693–725. doi: 10.1093/rof/rfr028

Giannetti, M., and Wang, T. Y. (2016). Corporate scandals and household stock market participation. *J. Finance* 71, 2591–2636. doi: 10.1111/jofi.12399

Grant, P. M., and Beck, A. T. (2008). Defeatist beliefs as a mediator of cognitive impairment, negative symptoms, and functioning in schizophrenia. *Schizophr. Bull.* 35, 798–806. doi: 10.1093/schbul/sbn008

Grinblatt, M., Keloharju, M., and Linnainmaa, J. (2011). IQ and stock market participation. *J. Finance* 66, 2121–2164. doi: 10.1111/j.1540-6261.2011.01701.x

Gürdal, M. Y., Kuzubaş, T. U., and Saltoğlu, B. (2017). Measures of individual risk attitudes and portfolio choice: evidence from pension participants. *J. Econ. Psychol.* 62, 186–203. doi: 10.1016/j.joep.2017.06.010

Hadi, F. (2017). Effect of emotional intelligence on investment decision making with a moderating role of financial literacy. *China USA Bus. Rev.* 16, 53–62.

Hair, J. F., Anderson, R. E., Tatham, R. L., and William, C. (1998). *Black (1998), Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *J. Mark. Theor. Pract.* 19, 139–152. doi: 10.2753/mtp1069-6679190202

Haliassos, M., and Bertaut, C. C. (1995). Why do so few hold stocks? *Econ. J.* 105, 1110–1129. doi: 10.2307/2235407

Häusler, A. N., Kuhnen, C. M., Rudorf, S., and Weber, B. (2018). Preferences and beliefs about financial risk taking mediate the association between anterior insula activation and self-reported real-life stock trading. *Sci. Rep.* 8:11207.

Hayat, A., and Anwar, M. (2016). Impact of behavioural biases on investment decision; moderating role of financial literacy. *Moder. Role Financial Liter.* 2016:14.

Heaton, J., and Lucas, D. (2000). Portfolio choice in the presence of background risk. *Econ. J.* 110, 1–26. doi: 10.1111/1468-0297.00488

Hilton, D. J. (2001). The psychology of financial decision-making: applications to trading, dealing, and investment analysis. *J. Psychol. Financial Mark.* 2, 37–53. doi: 10.1207/s15327760jpfm0201_4

Hong, H., Kubik, J. D., and Stein, J. C. (2004). Social interaction and stock-market participation. *J. Finance* 59, 137–163. doi: 10.1111/j.1540-6261.2004.00629.x

Hoyle, R. H., and Smith, G. T. (1994). Formulating clinical research hypotheses as structural equation models: a conceptual overview. *J. Consult. Clin. Psychol.* 62:429. doi: 10.1037/0022-006x.62.3.429

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscipl. J.* 6, 1–55. doi: 10.1080/10705519909540118

Hurd, M., Van Rooij, M., and Winter, J. (2011). Stock market expectations of Dutch households. *J. Appl. Econometr.* 26, 416–436. doi: 10.1002/jae.1242

Kaustia, M., and Torstila, S. (2008). Political preferences and stock market participation. *Helsinki School of Economics Working Paper Series*, Finland: University of Helsinki.

Keller, C., and Siegrist, M. (2006a). Investing in stocks: the influence of financial risk attitude and values-related money and stock market attitudes. *J. Econ. Psychol.* 27, 285–303. doi: 10.1016/j.joep.2005.07.002

Keller, C., and Siegrist, M. (2006b). Money attitude typology and stock investment. *J. Behav. Finance* 7, 88–96. doi: 10.1207/s15427579jpfm0702_3

Kengatharan, L., and Kengatharan, N. (2014). The influence of behavioural factors in making investment decisions and performance: study on investors of Colombo Stock Exchange, Sri Lanka. *Asian J. Finance Acc.* 6:1. doi: 10.5296/ajfa.v6i1.4893

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*, 3rd Edn, New York, NY: The Guilford Press.

Klontz, B., Britt, S. L., Mentzer, J., and Klontz, T. (2011). Money beliefs and financial behaviours: development of the klontz money script inventory. *J. Financial Ther.* 2, 1–22.

Klontz, B. T., and Britt, S. L. (2012). How clients' money scripts predict their financial behaviours. *J. Financial Plan.* 25, 33–43.

Korniotis, G. M., and Kumar, A. (2011). Do older investors make better investment decisions? *Rev. Econ. Statist.* 93, 244–265. doi: 10.1162/rest_a_00053

Kumar, A., Page, J. K., and Spalt, O. G. (2011). Religious beliefs, gambling attitudes, and financial market outcomes. *J. Financial Econ.* 102, 671–708. doi: 10.1016/j.jfineco.2011.07.001

Lapp, W. M. (2010). *The Missing Link: Financial Self-Efficacy's Critical Role in Financial Capability*. EARN White Paper. San Francisco, CA: EARN Research Institute.

Li, G. (2014). Information sharing and stock market participation: evidence from extended families. *Rev. Econ. Statist.* 96, 151–160. doi: 10.1162/rest_a_00301

Liivamägi, K., Vaarmets, T., and Talpsepp, T. (2019). Investor education and IPO participation. *Emerg. Mark. Finance Trade* 55, 545–561. doi: 10.1080/1540496x.2018.1443806

Lim, H., Heckman, S., Montalto, C. P., and Letkiewicz, J. (2014). Financial stress, self-efficacy, and financial help-seeking behaviour of college students. *J. Finan. Counsel. Plan.* 25, 148–160.

Lown, J. M. (2011). Development and validation of a financial self-efficacy scale. *J. Financial Counsel. Plan.* 22:54.

Luotonen, N. (2009). *Personal Values and Stock Market Participation-Evidence from Finnish University Students*. Helsinki: Aalto University.

Lusardi, A., and Mitchell, O. S. (2008). Planning and financial literacy: how do women fare? *Am. Econ. Rev.* 98, 413–417. doi: 10.1257/aer.98.2.413

Lusardi, A., Mitchell, O. S., and Curto, V. (2010). Financial literacy among the young. *J. Consum. Affairs* 44, 358–380.

MacCallum, R. C., Browne, M. W., and Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychol. Methods* 1:130. doi: 10.1037/1082-989x.1.2.130

Malmendier, U., and Nagel, S. (2011). Depression babies: do macroeconomic experiences affect risk taking? *Q. J. Econ.* 126, 373–416. doi: 10.1093/qje/qjq004

McAvay, G. J., Seeman, T. E., and Rodin, J. (1996). A longitudinal study of change in domain-specific self-efficacy among older adults. *J. Gerontol. Ser. B Psychol. Sci. Soc. Sci.* 51, 243–253.

Medina, J. F., Saegert, J., and Gresham, A. (1996). Comparison of Mexican-American and Anglo-American attitudes toward money. *J. Consum. Affairs* 30, 124–145. doi: 10.1111/j.1745-6606.1996.tb00728.x

Montford, W., and Goldsmith, R. E. (2016). How gender and financial self-efficacy influence investment risk taking. *Intern. J. Consumer Stud.* 40, 101–106. doi: 10.1111/ijcs.12219

Morrin, M., Broniarczyk, S. M., and Inman, J. J. (2012). Plan format and participation in 401 (k) plans: the moderating role of investor knowledge. *J. Public Pol. Mark.* 31, 254–268. doi: 10.1509/jppm.10.122

Niu, G., Wang, Q., Li, H., and Zhou, Y. (2020). Number of brothers, risk sharing, and stock market participation. *J. Bank. Finance* 113:105757. doi: 10.1016/j.jbankfin.2020.105757

Nosić, A., and Weber, M. (2010). How riskily do I invest? The role of risk attitudes, risk perceptions, and overconfidence. *Dec. Analy.* 7, 282–301. doi: 10.1287/deca.1100.0178

Noussair, C. N., Trautmann, S. T., and van de Kuilen, G. (2013). Higher order risk attitudes, demographics, and financial decisions. *Rev. Econ. Stud.* 81, 325–355. doi: 10.1093/restud/rdt032

O'Connor, E. L., and White, K. M. (2010). Willingness to trial functional foods and vitamin supplements: the role of attitudes, subjective norms, and dread of risks. *Food Q. Pref.* 21, 75–81. doi: 10.1016/j.foodqual.2009.08.004

Parrotta, J. L., and Johnson, P. J. (1998). The impact of financial attitudes and knowledge on financial management and satisfaction of recently married individuals. *J. Finan. Counsel. Plan.* 9:59.

Perry, V. G., and Morris, M. D. (2005). Who is in control? The role of self-perception, knowledge, and income in explaining consumer financial behaviour. *J. Consum. Affairs* 39, 299–313. doi: 10.1111/j.1745-6606.2005.00016.x

Phan, T. C., Rieger, M. O., and Wang, M. (2019). Segmentation of financial clients by attitudes and behaviour: : a comparison between Switzerland and Vietnam. *Intern. J. Bank Mark.* 37, 44–68. doi: 10.1108/ijbm-07-2017-0141

Podsakoff, P. M., and Organ, D. W. (1986). Self-reports in organizational research: problems and prospects. *J. Manag.* 12, 531–544. doi: 10.1177/014920638601200408

Ponchio, M. C., Cordeiro, R. A., and Gonçalves, V. N. (2019). Personal factors as antecedents of perceived financial well-being: evidence from Brazil. *Intern. J. Bank Mark.* 37, 1004–1024. doi: 10.1108/ijbm-03-2018-0077

Qamar, M. A. J., Khemta, M. A. N., and Jamil, H. (2016). How knowledge and financial self-efficacy moderate the relationship between money attitudes and personal financial management behaviour. *Eur. Online J. Nat. Soc. Sci.* 5:296.

Rao, Y., Mei, L., and Zhu, R. (2016). Happiness and stock-market participation: empirical evidence from China. *J. Happiness Stud.* 17, 271–293. doi: 10.1007/s10902-014-9594-4

Reilly, F. K., and Brown, K. C. (2011). *Investment Analysis and Portfolio Management*. Boston, MA: Cengage Learning.

Rha, J. Y., Montalto, C. P., and Hanna, S. D. (2006). The effect of self-control mechanisms on household saving behaviour. *J. Financ. Counsel. Plan.* 17:14.

Riitsalu, L., and Murakas, R. (2019). Subjective financial knowledge, prudent behaviour and income: The predictors of financial well-being in Estonia. *Intern. J. Bank Mark.* 37, 934–950. doi: 10.1108/ijbm-03-2018-0071

Roberts, J. A., and Jones, E. (2001). Money attitudes, credit card use, and compulsive buying among American college students. *J. Consum. Affairs* 35, 213–240. doi: 10.1111/j.1745-6606.2001.tb00111.x

Rose, G. M., Bakir, A., and Gentina, E. (2016). Money meanings among French and American adolescents. *J. Consum. Mark.* 33, 364–375. doi: 10.1108/jcm-07-2015-1497

Rothwell, D. W., Khan, M. N., and Cherney, K. (2016). Building financial knowledge is not enough: financial self-efficacy as a mediator in the financial capability of low-income families. *J. Commun. Pract.* 24, 368–388. doi: 10.1080/10705422.2016.1233162

Saurabh, K., and Nandan, T. (2018). Role of financial risk attitude and financial behaviour as mediators in financial satisfaction: empirical evidence from India. *S. Asian J. Bus. Stud.* 7, 207–224. doi: 10.1108/sajbs-07-2017-0088

Schmidt, N. (2010). What drives investments into mutual funds? Applying the theory of planned behaviour to individuals' willingness and intention to purchase mutual funds. *Paper Presented at the Conference Proceeding*, Stuttgart.

Seasholes, M. S., and Zhu, N. (2010). Individual investors and local bias. *J. Finance* 65, 1987–2010. doi: 10.1111/j.1540-6261.2010.01600.x

Shevlin, M., and Miles, J. N. (1998). Effects of sample size, model specification and factor loadings on the GFI in confirmatory factor analysis. *Pers. Indiv. Differ.* 25, 85–90. doi: 10.1016/s0191-8869(98)00055-5

Shih, T.-Y., and Ke, S.-C. (2014). Determinates of financial behaviour: insights into consumer money attitudes and financial literacy. *Serv. Bus.* 8, 217–238. doi: 10.1007/s11628-013-0194-x

Shim, S., Serido, J., and Tang, C. (2012). The ant and the grasshopper revisited: the present psychological benefits of saving and future oriented financial behaviours. *J. Econ. Psychol.* 33, 155–165. doi: 10.1016/j.joep.2011.08.005

Shim, S., Xiao, J. J., Barber, B. L., and Lyons, A. C. (2009). Pathways to life success: a conceptual model of financial well-being for young adults. *J. Appl. Dev. Psychol.* 30, 708–723. doi: 10.1016/j.appdev.2009.02.003

Shusha, A. A. (2017). Does financial literacy moderate the relationship among demographic characteristics and financial risk tolerance? Evidence from Egypt. *Austr. Acc. Bus. Finance J.* 11, 67–86. doi: 10.14453/aabfj.v11i3.6

Sivaramakrishnan, S., Srivastava, M., and Rastogi, A. (2017). Attitudinal factors, financial literacy, and stock market participation. *Intern. J. Bank Mark.* 35, 818–841. doi: 10.1108/ijbm-01-2016-0012

Sutter, M., Kocher, M. G., Glätzle-Rützler, D., and Trautmann, S. T. (2013). Impatience and uncertainty: experimental decisions predict adolescents' field behaviour. *Am. Econ. Rev.* 103, 510–531. doi: 10.1257/aer.103.1.510

Tang, T. L., and Baumeister, R. F. (1984). Effects of personal values, perceived surveillance, and task labels on task preference: the ideology of turning play into work. *J. Appl. Psychol.* 69:99. doi: 10.1037/0021-9010.69.1.99

Tang, T. L. P. (1992). The meaning of money revisited. *J. Organ. Behav.* 13, 197–202. doi: 10.1002/job.4030130209

Tang, T. L.-P. (2016). Theory of monetary intelligence: money attitudes—religious values, making money, making ethical decisions, and making the grade. *J. Bus. Ethics* 133, 583–603. doi: 10.1007/s10551-014-2411-5

Tang, T. L.-P., and Gilbert, P. R. (1995). Attitudes toward money as related to intrinsic and extrinsic job satisfaction, stress and work-related attitudes. *Pers. Indiv. Differ.* 19, 327–332. doi: 10.1016/0191-8869(95)00057-d

Tigges, P., Riegert, A., Jonitz, L., Brengelmann, J., and Engel, R. R. (2000). Risk behaviour of East and West Germans in handling personal finances. *J. Psychol. Financial Mark.* 1, 127–134. doi: 10.1207/s15327760jpfm0102_4

Tversky, A., and Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science* 211, 453–458. doi: 10.1126/science.7455683

Van Rooij, M., Lusardi, A., and Alessie, R. (2011). Financial literacy and stock market participation. *J. Financial Econ.* 101, 449–472. doi: 10.1016/j.jfineco.2011.03.006

Van Rooij, M. C., Lusardi, A., and Alessie, R. J. (2012). Financial literacy, retirement planning and household wealth. *Econ. J.* 122, 449–478. doi: 10.1111/j.1468-0297.2012.02501.x

Wäneryd, K.-E. (2001). *Stock-Market Psychology: How People Value and Trade Stocks*. Cheltenham: Edward Elgar Publishing.

Wang, C.-Y. (2019). Customer participation and the roles of self-efficacy and adviser-efficacy. *Intern. J. Bank Mark.* 37, 241–257. doi: 10.1108/ijbm-10-2017-0220

Wanyana, B., Nabeta, I. N., and Ntayi, J. (2011). *Investor Awareness, Perceived Risk Attitudes, and Stock Market Investor Behaviour: A Case of Uganda Securities Exchange*, Masters thesis, Makerere University, Kampala.

Wärneryd, K.-E. (1996). Risk attitudes and risky behaviour. *J. Econ. Psychol.* 17, 749–770. doi: 10.1016/s0167-4870(96)00034-7

Wärneryd, K.-E. (2001). *Stock-Market Psychology*. Northampton, MA: Edward Elgar.

Watson, J. J. (2003). The relationship of materialism to spending tendencies, saving, and debt. *J. Econ. Psychol.* 24, 723–739. doi: 10.1016/j.joep.2003.06.001

Weisfeld-Spolter, S., Sussan, F., Rippé, C., and Gould, S. (2018). Integrating affect, cognition, and culture in Hispanic financial planning. *Intern. J. Bank Mark.* 36, 726–743. doi: 10.1108/ijbm-09-2017-0201

Wood, R., and Zaichkowsky, J. L. (2004). Attitudes and trading behaviour of stock market investors: a segmentation approach. *J. Behav. Finance* 5, 170–179. doi: 10.1207/s15427579jpfm0503_5

Xiao, J. J., Chen, C., and Chen, F. (2014). Consumer financial capability and financial satisfaction. *Soc. Indic. Res.* 118, 415–432. doi: 10.1007/s11205-013-0414-8

Yamauchi, K. T., and Templer, D. J. (1982). The development of a money attitude scale. *J. Pers. Assess.* 46, 522–528. doi: 10.1207/s15327752jpa4605_14

Yu-Jen Hsiao, W.-C. T. (2018). Financial literacy and participation in the derivatives markets. *J. Bank. Finance* 88, 15–29. doi: 10.1016/j.jbankfin.2017.11.006

Zhang, D. C., Highhouse, S., and Nye, C. D. (2019). Development and validation of the General Risk Propensity Scale (GRiPS). *J. Behav. Dec. Mak.* 32, 152–167. doi: 10.1002/bdm.2102

Zhang, Y., and Li, H. (2011). Investors' risk attitudes and stock price fluctuation asymmetry. *Phys. A Statist. Mech. Appl.* 390, 1655–1661. doi: 10.1016/j.physa.2011.01.002

Zou, J., and Deng, X. (2019). Financial literacy, housing value and household financial market participation: evidence from urban China. *China Econ. Rev.* 55, 52–66.

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Ahead of the Curve: Leveraging Antecedents of Corporate Entrepreneurship to Pull Off Competitive Advantage

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Entrepreneurship is a highly dynamic and important endeavor that spills over to economic, technological, and social canvas of a society in this rapidly changing globalized economy. The purpose of the present quantitative study is to investigate the associations among information and communication technologies, innovation, absorptive capacity, CEO's temporal leadership, and competitive advantage by considering corporate entrepreneurship as a mediator. These factors have been incorporated because they play a predominant role to vie in a competitive environment for entrepreneurial success and economic growth. We used the response of 460 organizations, acquired on a Likert scale, to examine how antecedents of corporate entrepreneurship contribute toward competitive advantage. Structural equation modeling was employed to analyze the measurement and structural relationships including the mediation effects of corporate entrepreneurship. All the relationships with corporate entrepreneurship were found significant except the direct effect of absorptive capacity on competitive advantage. Hence, the results established corporate entrepreneurship as a mediator to predict competitive advantage partially by information and communication technologies (ICT) use, innovation, and temporal leadership. The findings also reveal that absorptive capacity reaps an entire competitive advantage only through corporate entrepreneurship. Practically, the study would be invaluable for organizations, entrepreneurs, and managers to capture a lot of opportunities in effectively managing scarce resources.

Keywords: corporate entrepreneurship, information and communication technologies, innovation, absorptive capacity, chief executive officer's temporal leadership, competitive advantage

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INTRODUCTION

The new economic and business setting caused by complex technological advances and an uncertain environment calls for faster and innovative response strategies to maintain competitive advantage. With the inability to perceive this departure, many projects failed, and consequently, organizations were unsuccessful to achieve their planned goals (Yunis et al., 2018). Recently, a study by Klynveld Peat Marwick Goerdeler (KPMG, a professional service company and one of the Big Four auditors) has examined that 70% of businesses suffered loss in their projects and

50% failed to attain their intended goals (Amankwah-Amoah, 2016). Gartner (2012) stated that 55–75% of projects of enterprise resource planning (ERP) and more than 70% of information system projects did not achieve their businesses goals. Moreover, 74.1% of these suffered loss due to excessive cost, while 50% are not realizing benefits (Jacobs, 2012). Gartner also reported that only 30% of projects of information system attain business objectives (Saran, 2012). The aforementioned projects' failures could be attributed to numerous problems such as the lack of entrepreneurial activities and poor competitive strategy positioning of IT firms (Carlton, 2014).

Corporate entrepreneurship (CE) is a riposte for the survival and competitive success of business entities in this current situation (Bojica and Fuentes, 2012). Entrepreneurial organizations hinge on specific attitudes and behaviors. This organizational entrepreneurial behavior is bespoken by its transfiguration into a superior entity, emerging out of pattern of resource deployment. Both the frequency and success of endeavors revolve around the configuration of strategic assets such as information and communication technologies (ICT), innovation, absorptive capacity, and temporal leadership. Therefore, it is necessary for the academic community to study the psychology of entrepreneurship in order to discover new horizons (Baum et al., 2007). However, being a novel research area, the psychology of entrepreneurship is yet to be explored in economic, social, personal, and societal contexts (Gorgievski and Stephan, 2016). Previous studies (for example, Kuratko and Audretsch, 2013) have examined how corporate entrepreneurship relates with firms' resources such as innovation and ICT. However, there is still a need for integrated studies in today's knowledge-based globalized economy to analyze the impact of ICT and innovation on competitive advantage while considering the mediating role of corporate entrepreneurship (Yunis et al., 2018). Although corporate entrepreneurship has immense prospect to establish competitive advantage, the configuration of individual antecedents of CE poses considerable challenges (Mostafiz, 2020). There are many studies that accentuate CE (for example, Chen S. et al., 2015; Burgers and Covin, 2016; Mazzei et al., 2017), but how it ties in with ICT, innovation, absorptive capacity, temporal leadership, and competitive advantage remains unexplored. Therefore, the role of these strategic assets in promoting corporate entrepreneurial activities warrants additional research. Conclusively, it can be enounced that the mere focus on CE is inescapable but not enough to outclass the competition. Thus, in this study, we draw on this frame of reference to develop and examine the forenamed links. In order to make a doable study, we have identified four types of inquiries into corporate entrepreneurship leading toward competitive advantage: ICT use, innovation, absorptive capacity, and CEO's temporal leadership. The subsequent illustration of corporate entrepreneurship, its antecedents, and consequences would help better understand the psychology of the whole entrepreneurial process.

Corporate entrepreneurship is the ability of an organization to explore and exploit profitable opportunities without being inhibited by limitations of resources, rules, and regulations, as well as managerial decisions (Otache and Mahmood, 2015). It may also be viewed as a set of firms' activities that involve innovation, corporate venturing, and strategic renewal acting as a main driving force in achieving competitive advantage by entering into the external environment (Zahra, 1996). So, the entrepreneurial activities of the organizations (corporate entrepreneurship) can be regarded as corporate venturing, risk-taking, innovation, strategic renewal, and proactiveness. There are different elements that drive corporate entrepreneurship, for example, cultural diversity, organizational structure, etc. (Covin et al., 2006). Likewise, the entrepreneurial spirit is swayed by different factors such as ICT use, innovation, absorptive capacity, and CEO's temporal leadership (Chen S. et al., 2015; Burgers and Covin, 2016; Mazzei et al., 2017).

ICT use can be defined as a "diverse set of technological tools and resources used to create, disseminate, store, and manage information" (Blurton, 2005, p. 1). The effective utilization of ICT resources provides new opportunities for developing novel products, business models, and services. The fast changing environment of business has increased the dependence on ICT that, in turn, has pushed it toward innovative activities for obtaining higher efficiency and attaining competitive advantage in a dynamic market (Igun, 2014). Therefore, innovations are also very important for the growth of a company and competing with other organizations in the current dynamic and competitive environment. It is a process that increases the firms' value web and chain by way of services, new products, procedures of work, commercialization system, and solutions (McFadzean et al., 2005). Innovation also focuses on those activities that show change into the present business patterns, and develops new business ventures that lead toward new product formation by creating new markets (Kuratko and Audretsch, 2013; Ramos-González et al., 2017). A profound study of corporate entrepreneurship and its role can integrate ICT and innovation into the firm's beneficial resources and strategies for achieving a higher level of competitive advantage (Yunis et al., 2018). ICT and innovation are generally strategic resources of an organization which can develop the firm's activities through entrepreneur behavior and ability (Yunis et al., 2017).

One of the other entrepreneurial constituents is absorptive capacity which can be defined as "the organization's relative ability to develop a set of organizational routines and strategic processes through which it acquires, assimilates, transforms and exploits knowledge acquired from outside the organization in order to create value" (Jiménez-Barrionuevo et al., 2019, p. 3037). In other words, it is the ability through which organizations can develop, learn, integrate, and apply new knowledge (Najafi Tavani et al., 2013). It not only develops available knowledge of organizations but also encourages for the creation of innovative knowledge activities that lead toward entrepreneurial success (Bojica and Fuentes, 2012). Firms which continuously invest in adapting and taking advantage of new external knowledge are most likely to capitalize on an ever fluctuating competitive environment and generate new innovative products. Firms should develop this capacity if they wish to adapt to changes in an increasingly competitive and changing environment (Jiménez-Barrionuevo et al., 2019).

Similarly, due to fast changes in customer likening, advancement in technologies, and competition, firms are now forced to think about time. This time issue has brought organizations to the frontline for research in strategic management (Bridoux et al., 2013). According to the dynamic capability theory, timely approachability to the market dynamics and fast products innovation decides the organizations' success and helps them gain competitive advantage. Therefore, by proficiently allocating temporal resources, firms can lead toward strategic initiatives to innovate. It also must ensure that top management teams dedicate their important time to supervise the corporate entrepreneurial activities (Shimizu, 2012). Temporal leadership is a set of leader's behavior related to the temporal traits of team tasks that comprise three activities: *allocation of temporal resources*, *scheduling*, and *temporal synchronization* (Mohammed and Nadkarni, 2011). The allocation of temporal resources involves the distribution of time in the activities of the team efficiently and effectively, specifically when time pressure is at the extreme (Mohammed and Nadkarni, 2011). Scheduling is a specific timeline for completing the team activities, whereas temporal synchronization involves coordination and temporally sequencing the team members' activities and addresses the question of how to complete the task. The leaders give priority to team goals, allocation of time for subtasks, and form time built-in blocks for unpredicted contingency gaps, for example, configuration of team members and development of coordination among them on a specific time (Maruping et al., 2015). They also make a clear framework to ensure that every member of the team completes his or her task timely, and continually modify this framework while accommodating deviations, delays, and gaps (Maruping et al., 2015).

Considering the foregoing discussion, the interplay of CE with the most promising antecedents and its dénouement in the form of competitive advantage is the focus of current research. The study, designed on this premise, would help managers, entrepreneurs, innovation adopters, and technology suppliers to capitalize on dynamic capabilities and value creation resources (corporate entrepreneurship, ICT, innovation, absorptive capacity, and temporal leadership). These resources, once transformed into competitive advantage, would help face the global challenges.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Information and Communication Technologies Use and Corporate Entrepreneurship

In the contemporary competitive world, entrepreneurs operate their business in a technology-rich environment. Entrepreneurs must also perform their activities earnestly while using tools of computing, online communication, and cooperation (van Laar et al., 2017). ICT use improves productivity by contributing not only toward effectiveness in operations and inventory management but also toward the integration of activities (Igun, 2014; Liao et al., 2015). The adoption and effective use of ICT affect both operational efficiency and economic growth in public and private institutions. Therefore, it has become inevitable for organizations to adopt new technologies like ICT to survive in a rapidly changing business environment (Shah Alam et al., 2011).

However, investment in ICT should not be made in isolation, but it must be aligned with goals, missions, strategies, and directions of the organization. It must also be adopted according to users' requirements, and ICT jobs must be well determined (Pagano and Brügge, 2013). Tang et al. (2015) have examined that corporate entrepreneurship is influenced by IT skills in myriad ways, for example, revitalizing and revamping the structure of business, supporting functions for making and sharing information, enhancing the system of communication and their outcome of interrelated parts, etc. While examining the role of ICT and entrepreneurship development in Iran, six advantages were found which are as follows: improvement of infrastructure services, motivation promotion, improvement in business performance, organizational factor, technology, and information factor (Hosseini et al., 2014). In a nutshell, ICT not only supports corporate activities but also provides basis for implementation of new network, firm practices, human capital training, and development of labor polices and spillovers the effects of technology and knowledge (Venturi, 2015). Thus,

H_1: ICT use has a significant impact on corporate entrepreneurship.

Innovation and Corporate Entrepreneurship

Innovative organizations preemptively use innovation strategies for making business models, services, and new products and, hence, build a strong relationship between innovation and entrepreneurship to outperform in competitive markets. Due to the fast growing progress in technology and science, product innovation has become an overriding concern for those firms who are struggling to achieve competitive advantage (Chen S. et al., 2015; Chen Y. et al., 2015). For firms that adopt corporate entrepreneurship in their businesses, creation of new products becomes necessary for them (Kuratko et al., 2015). Innovation-based corporate entrepreneurship is a development that emphasizes and clarifies the relationship between research areas of corporate entrepreneurship and innovation (Salamzadeh and Kirby, 2017). Innovation and entrepreneurship are positively related to each other to help an organization to be more successful and expansive (de Jong, 2013; Jarrar and Smith, 2014; Urban and Wood, 2015). Technological innovation can play a significant role to achieve higher level economic benefits by facilitating the production of new goods and services if it is well arranged and supported. Research on innovation at the organization level shows the significance of corporate entrepreneurship while exploiting the innovative opportunities (Szirmai et al., 2013). It can also be said that technological innovation adoption alone is not enough to sustain competitive advantage, but the benefits can be achieved through more systematic and complex ways (Martín-Rojas et al., 2017).

In modern businesses, fusion of innovation and entrepreneurship is a high-level strategy for achieving success (Kuratko et al., 2014). Considering the abovementioned discussion, we may propose the following hypothesis:

H_2: Innovation has a significant impact on corporate entrepreneurship.

Absorptive Capacity and Corporate Entrepreneurship

Firms with absorptive capacity increase their performance through access of external knowledge and show their willingness to reciprocate toward the external environment by innovative ways (García-Sánchez et al., 2018). Absorptive capacity also plays a significant role to determine the range of knowledge flows (Hurmelinna-Laukkanen et al., 2012). External knowledge exploitation supports firms to increase their knowledge base and identify new opportunities that are present in the market, as well as sponsor the new products and technologies to manage their resources effectively (Forés and Camisón, 2016). Knowledge absorptive capacity can be constantly utilized to acquire and digest external knowledge. Therefore, it becomes important for an organization to identify opportunities in the market by using this new or external knowledge to get innovation (Xie et al., 2018). Organizations from external sources gain and exploit knowledge to improve their resources (Ali et al., 2016). According to the knowledge base theory, absorptive capacity significantly increases the capacity of an organization to recognize and find out new opportunities by reducing cognitive inflexibility and developing new abilities among top executives (Espejo and Dominici, 2017). Absorptive capacity has a direct impact on factors that promote corporate entrepreneurial system (Belderbos et al., 2016). Researchers have found significant direct and indirect relationships between absorptive capacity and a firm's entrepreneurial performance (Bharati et al., 2014). Realized absorptive capacity brings new ideas within the firm, increases the capability to recognize these novel ideas, creates strength, and ultimately, develops the ability to understand opportunities (Cepeda-Carrion et al., 2012). Some studies also considered the issue that absorptive capacity is strategically important for creating new opportunities for business by encouraging corporate entrepreneurship and enhancing firm performance (Martín-Rojas et al., 2011).

Considering the abovementioned discussion, we may propose the following hypothesis:

H_3: Absorptive capacity has a significant impact on corporate entrepreneurship.

CEO's Temporal Leadership and Corporate Entrepreneurship

Temporal leadership, managed by leaders to meet deadlines, is an important factor for entrepreneurship because it acts as a coordinator between work, various time frames, and member contributions (Mohammed and Alipour, 2014). CEOs' temporal leadership and their behavior related to temporal aspects of higher management team affairs are the important mechanisms of CEOs' pacing style and time urgency in shaping strategic activities of organizations (Mohammed and Nadkarni, 2011). It represents arrangements and development of activities, allocation of temporal resources, and synchronization of activities for the completion of tasks. The clarification of schedules and the allocation of temporal resources effectively reduce the ambiguity of tasks completion, disagreements, meeting deadlines, and how teams perform activities of tasks. These also help understand how team members spend time on every task to meet the targets (Standifer et al., 2015). Chalking out coherent schedules, making long-term objectives, and setting temporal milestones and subtasks not only help the top management team in providing clear directions to the firm's members for corporate entrepreneurship activities inside the organizations but also facilitate in performing corporate entrepreneurial activities across the firm within time frames. So, the coherent scheduling of strategic actions outside the firm ensures a clear and combined plan of activities within the top management team members for framing and applying corporate entrepreneurial activities. Therefore, these schedules not only assist top management teams to watch the progress of every activity but also support timely completion of initiatives of corporate entrepreneurship (Chen and Nadkarni, 2017). However, toward the timely completion of goals, the leader and follower must be properly sequenced to energetically regulate the individual work activities, which is not possible without a strong temporal leadership. This discrepancy between the follower temporal behavior and leader's ideal temporal prototype will lead toward failure of coordination (Alipour et al., 2017). Therefore, since the temporal leadership behavior is employed by the team leader, it must be ensured that all team members agree on tasks policies and must follow these strategies and allocate temporal resources efficiently toward the tasks (Mohammed and Nadkarni, 2011). Furthermore, temporal leadership helps team members take advantage of optimistic effects of intermediate levels of time pressure because entrepreneurs see time pressure an aspect of motivation. Therefore, temporal leadership supports entrepreneurs to take positive benefit of time pressure who make their plans and activities according to time constraints (Maruping et al., 2015). In view of the foregoing discussion, we may propose the following hypothesis:

H_4: CEO's temporal leadership has a significant impact on corporate entrepreneurship.

Corporate Entrepreneurship and Competitive Advantage

The success of entrepreneurship is associated with unique knowledge, skills of executives, and experience of entrepreneurs (Staniewski, 2016). Experience, acquired from any type of entrepreneurship, increases the probability of undertaking corporate entrepreneurship (Urbano and Turró, 2013). The individual knowledge and experience acquired from prior entrepreneurial activities also influence further intentions to enhance growth (Miralles et al., 2016). Therefore, it can be enunciated that corporate entrepreneurship is not only an activity of a firm's capabilities but also it is about how these capabilities

are beneficial to achieve the desired result (Stevens et al., 2015). Specifically, the relationship between corporate entrepreneurship and competitive advantage is determined by non-financial and financial measures of latent variables. The non-financial measures comprise satisfaction and global success of business owners and managers (Daryani and Karimi, 2017; Prange and Pinho, 2017), whereas financial measures consist of revenues, return on capital, profit, return on assets, and return on equity among others. Hence, corporate entrepreneurship is a strong promoter of growth for new and existing businesses (Chen S. et al., 2015; Chen Y. et al., 2015). Taking into account these arguments, we may propose the following hypothesis:

H_5: Corporate entrepreneurship has a significant impact on competitive advantage.

ICT Use and Competitive Advantage

Information and communication technologies is the most significant element for economic development, and its extraordinary functions have brought fundamental changes for the development of research and education. Corporate entrepreneurship enabled by innovation and ICT aligns a firm's strategies and resources because it constitutes dimensions that are vital for an organization to attain competitive advantage (Kuratko and Audretsch, 2013). Organizing resources of ICT toward increasing firm performance and attaining competitive advantage needs a firm culture, which in turn can support in finding and assessing new opportunities and making use of these new avenues (Agarwal and Brem, 2015). Therefore, ICT use is the core factor for entrepreneurial development that contributes toward new job opportunities in e-markets, and also facilitates in selling the merchandise in cyberspace (Haghighi et al., 2018). Thus, it can be articulated that the role of information and communications technology is not only as a tool to increase efficiency of a firm's internal processes but also as a source to attain competitive advantage (Lusch and Nambisan, 2015). In this way, ICT, playing a critical role as the alpha and omega of competitive advantage, leads toward lower cost and better services (Andersen, 2015; Cohen and Olsen, 2015). Consequentially, the effective use of ICT adoption contributes toward competitive advantage and a successful organization (Manochehri et al., 2012). Hence, we propose the following hypothesis:

H_6: ICT has a significant impact on competitive advantage.

Innovation and Competitive Advantage

Due to multitudinous changes in the global world, corporate entrepreneurship starts new activities for organizations, follows new innovation processes, and takes interest in departing from the daily unchanging process for exploring, creating, and chasing new profitable opportunities (García-Morales et al., 2014). In order to achieve success in this competitive environment, product development is indispensable, and the literature suggests that it is a component of corporate entrepreneurial movements (Kuratko and Audretsch, 2013). Today, undeterred by the changing economies, business innovation in products and services plays an important role. In this age of technology and competitive environment, unique and dynamic business innovations are very essential for the growth of business and in vying for the market share (Malaquias et al., 2016). As innovation can transform ICT resources, a firm's practices, and explicit and tacit knowledge into beneficial capabilities, therefore, competitive advantage can be achieved through innovation (Agarwal and Brem, 2015). However, in order to achieve a higher level of competitive advantage and opportunities, ICT resources and innovations must be well organized (Agarwal and Brem, 2015). Thus, we propose the following hypothesis:

H_7: Innovation has a significant impact on competitive advantage.

Absorptive Capacity and Competitive Advantage

Absorptive capacity can integrate internal and external knowledge for the firms to be employed to develop new products and services. In order to increase absorptive capacity, global enterprises make use of digital platforms to combine internal and external knowledge (Audretsch et al., 2014). An organization that constantly invests in integrating and exploiting new external knowledge gains advantages in emerging markets and a rapidly changing environment by developing innovative products (Rangus and Slavec, 2017). Absorptive capacity and corporate entrepreneurship are considered the key elements of the dynamic capabilities of an organization. The dynamic capability of a firm refers to how a firm utilizes its internal and external resources and deploy, redeploy, and reconfigure them for gaining a competitive advantage (Rehman et al., 2020). In general, a firm's ability to acquire, reconfigure, and integrate knowledge and understand innovative technologies bolster its competitive advantage (Chang et al., 2014). As a matter of fact, firms obtain knowledge through potential absorptive capacity and exploit it to reconfigure for their benefit through realized absorptive capacity (Ben-Oz and Greve, 2015; Leal-Rodríguez et al., 2015; Ali and Park, 2016). In a nutshell, firms accompanied by their proactive absorptive capacity hone their expertise to reciprocate to the dynamic environment, and provide the best opportunities to enhance competitive advantage by framing the entrepreneurial strategy (Bojica and Fuentes, 2012). Taking the preceding arguments into account, we propose the following hypothesis:

H_8: Absorptive capacity has a significant impact on competitive advantage.

CEO's Temporal Leadership and Competitive Advantage

The behavior of temporal leadership determines how teams respond effectively to time pressure. It supports members of the team in managing time, planning work, and attaining competitive advantage (Mohammed and Nadkarni, 2011; Maruping et al., 2015). So, the behavior of temporal leadership helps team members plan their tasks and manage time in order to attain competitive advantage (Mohammed and Nadkarni, 2011).

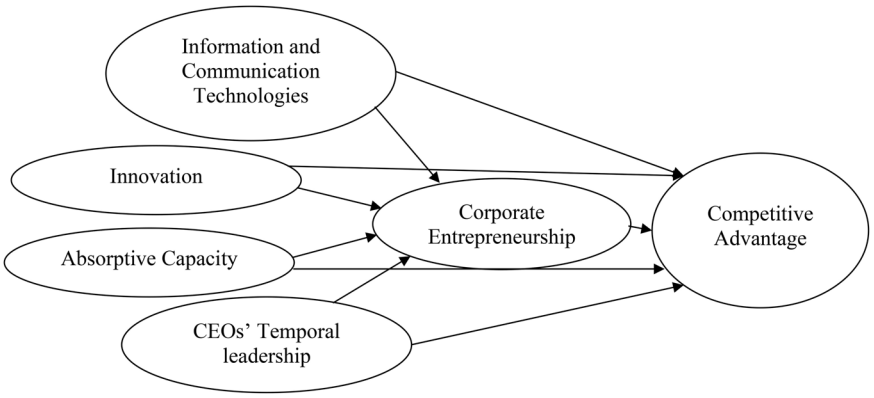

FIGURE 1 | Research model.

Temporal leadership has a positive relationship with entrepreneurship and also influences the competitive advantage (Mohammed and Nadkarni, 2011; Maruping et al., 2015). Moreover, how CEOs think and feel about time may have a colossal predominance in crafting their firm's strategies (Chen and Nadkarni, 2017). Therefore, we are of the view that:

H_9: CEO's temporal leadership has a significant impact on competitive advantage.

H_{10}: Corporate Entrepreneurship as a Mediator.

Since the industry is changing from traditional to economy-based as part of globalization, corporate entrepreneurship plays an important role in attaining a higher level of competitive advantage (Kuratko and Audretsch, 2013). The competitive and globalized environment poses myriad challenges. Despite these challenges, a lot of opportunities and competitive advantages can be achieved by organizations using ICT, innovative resources, and dynamic capabilities which, in turn, depend on the behavior of entrepreneurs (Yunis et al., 2018). ICT and innovation play an important role to cultivate corporate entrepreneurship and, consequently, increase organizational performance to the higher level by using the organization's resources and well-shaped strategies (Mortara et al., 2011). Corporate entrepreneurship is a situation embodied in organizational capabilities to effectuate competitive advantage (Stevens et al., 2015). In a competitive business environment, absorptive capacity and corporate entrepreneurship are considered a direct source of high performance for a firm. IT infrastructure flexibility facilitates a firm with exchanging knowledge, novelty in products, and new business venturing, which then helps in sustaining the competitive advantage (Jiménez-Barrionuevo et al., 2019; Martin-Rojas et al., 2019). Absorptive capacity enables firms to use the transmission of knowledge to pursue corporate entrepreneurship and also helps in meeting the looming challenges to corporate entrepreneurship (Jiménez-Barrionuevo et al., 2019). Organizations that exhibit corporate entrepreneurship are usually perceived as dynamic, flexible entities that prepare themselves to take benefit of new business opportunities (de Jong, 2013; Busenitz et al., 2014). Corporate entrepreneurship and accompanying activities are quite valuable for the firms' growth, productivity, and profitability, for they partake substantially in imparting novel ideas within organizations (Chen Y. et al., 2015). Therefore, CE plays a significant role for attaining the highest level of competitive advantage, productivity, and benefits of competitiveness (Agarwal and Brem, 2015). As a matter of course, CE is still a fitting factor that firms can resort to in order to attain competitive advantage and gain financial control in a competitive environment (Sarooghi et al., 2015). It also contributes to the ongoing activities of a business such as risk-taking, innovation, self-renewal, new business venturing, and proactivity (Chen Y. et al., 2015; Burgers and Covin, 2016; Mazzei et al., 2017). Therefore, based upon the cogent lines of argumentation, we assert the following:

H_{10-A}: Corporate entrepreneurship mediates the relationship between ICT use and competitive advantage.

H_{10-B}: Corporate entrepreneurship mediates the relationship between innovation and competitive advantage.

H_{10-C}: Corporate entrepreneurship mediates the relationship between absorptive capacity, CEO's temporal leadership, and competitive advantage.

H_{10-D}: Corporate entrepreneurship mediates the relationship between ICT use, innovation, absorptive capacity, CEO's temporal leadership, and competitive advantage.

Based upon the foregoing hypotheses, the research model is described in **Figure 1**.

METHODS

Participants and Procedure

The target population for this study comprises both middle- and upper-level employees working in Lahore-based IT sector of Pakistan. Being deductive in nature, the research

TABLE 1 | Demographic characteristics of the respondents.

	Frequency	Percent	Cumulative percent
Gender			
Male	415	90.22	90.22
Female	45	9.6	100
Age			
21–30 years	55	11.96	11.96
31–40 years	286	62.17	74.13
41–50 years	113	24.57	98.70
>50 years	6	1.30	100
Experience			
Less than and equal to 10 years	90	19.57	19.57
11–20 years	332	72.17	91.74
20 years and above	38	8.26	100
Designation			
Middle management	430	93.48	93.48
Upper management	30	6.52	100

employs a quantitative approach including a well-structured questionnaire. A convenient sampling process was used for collection of data from 460 firms through emails and direct meetings. The representative employees had knowledge about the use of ICT and orientation of innovation and were well-experienced about how to take advantage of absorptive capacity through entrepreneurial behavior in their firms. Although 600 questionnaires were distributed to the IT firms, only 495 of them were received and only 460 were found complete in all respects. Thus, the eventual response rate was computed to be 76.66%.

The sample size is consistent with the recommendations by Pallant (2005) and Kline (2010) to execute structural equation modeling (SEM)-based analyses in AMOS software. The characteristics of the study sample are reported in **Table 1**.

It can be observed from the gender-wise frequency analysis of the data that 90.4% of the sample comprised male employees, while 9.6% of the respondents were female. Hence, the dominant majority of the respondents were male in this data. As per the age frequency, 55 of the respondents, i.e., 11.96% of the total sample, belonged to the age group of 21–30 years, while in the age bracket of 31–40 years, there were 286 respondents equivalent to 62.17%. In the age cohort of 41–50 years, the number of respondents was 113, which is 24.57% of the total respondents, whereas 6 respondents belonged to the age group greater than 51 years (1.3%). The survey also collected data about work experience of the respondents. There were 90 respondents who had work experience of 1 to 10 years (19.57%), and there were 332 of the respondents who possessed work experience of 11–20 years, i.e., 72.17%. However, in the other experience category of 20 years and above, there were 38 respondents making up 8.26% of the total sample size. The designation of the respondents is another aspect of demographics which indicates that a total of 430 respondents belong to middle management making up 93.5% of the total sample. The remaining 30 respondents were part of the upper management (6.52%).

Measures

This study is a correlational design to examine the relationships among ICT use, innovation, temporal leadership, absorptive capacity, and corporate entrepreneurship to explore the potential causal impact of each of these factors on competitive advantage. As this research is deductive and quantitative in nature, it utilizes well-structured measurement scales made up of items denoting the respondents' thoughts and opinions about ICT use, innovation, temporal leadership, absorptive capacity, corporate entrepreneurship, and competitive advantage in their businesses. All items computing these attitudinal variables used the five-point Likert scale response format (1 for strongly disagree, 5 for strongly agree). Information and communication technology (ICT use), used as the independent variable, was measured by a four-item scale developed by Davis (1989), and further validated by Rogers (1995) and Agarwal and Prasad (1998) with sufficient reliability value (Cronbach's alpha = 0.84). An 11-item measuring scale, based on Gatignon et al. (2002), was used to measure another independent variable "innovation." The reported Cronbach's alpha value is 0.91. Similarly, an 11-item scale (Jiménez-Barrionuevo et al., 2019) was applied to measure another independent variable "absorptive capacity." In this study, the internal consistency value was observed to be 0.93. Likewise, a seven-item scale by Mohammed and Nadkarni (2011) was employed to measure the independent variable "temporal leadership." The study stated a reliability value of 0.87. In order to measure the mediator "corporate entrepreneurship," a six-item scale, with Cronbach's alpha value of 0.88, was utilized based on Zahra (1996). Finally, to evaluate the dependent variable competitive advantage, a seven-item scale, based on McDougall et al. (1994), was used. The internal consistency value was noted to be 0.89.

DATA ANALYSIS AND RESULTS

Research Design

Structural equation modeling has been used with the help of AMOS 24 for testing the proposed hypotheses empirically. SEM has two elements: the first is confirmatory factor analysis (CFA), which is used to measure the validity of a model comprising unobserved and observed variables, and second component is path analysis that is used to fit the structural model with the latent variables (Kline, 2010). In the first assessment, there is checking of the validity of indicators, whereas the second assessment specifies the process in which a certain latent variable directly or indirectly becomes a cause to change in other latent variable (Byrne, 2001). This two-step method guarantees that only the constructs with appropriate measures might be used in the structural model. Furthermore, measurement and structural models were evaluated through three fit measures, i.e., goodness of fit index (GFI), relative chi-square ratio over degree of freedom (χ^2/DF) and root mean square error approximation (RMSEA).

Due to the cross-sectional nature of the study, potential method biases caused by common method variance (CMV) may be present in the data collected (Spector 1994; Podsakoff et al., 2003). Therefore, it has to be checked to trace the

TABLE 2 | Cronbach's alpha, standard deviation, mean, and variance.

Measurement scale	Number of items	Cronbach's alpha	Min	Max	Mean	Std. deviation	Skewness	Kurtosis
ICT use	4	0.874	1.00	5.00	3.9279	0.56880	−0.516	1.686
Innovation	11	0.932	2.00	5.00	4.3175	0.49584	−0.641	1.006
Absorptive capacity	11	0.935	3.00	5.00	4.3407	0.50075	−0.430	−0.392
Temporal leadership	7	0.932	1.00	5.00	3.5631	0.76434	−0.528	0.626
Corporate entrepreneurship	6	0.922	2.00	5.00	4.1455	0.52045	−0.420	1.248
Competitive advantage	7	0.836	2.00	5.00	3.7665	0.69555	0.138	1.435

TABLE 3 | Correlations among the constructs.

Constructs	IN	CE	AC	TL	CA	ICT
Innovation	1	0.304**	0.352**	0.074	0.202**	0.082
Corporate entrepreneurship	0.304**	1	0.280**	0.347**	0.347**	0.359**
Absorptive capacity	0.352**	0.280**	1	0.046	0.091	0.101*
Temporal leadership	0.074	0.347**	0.046	1	0.150**	0.318**
Competitive advantage	0.202**	0.347**	0.091	0.150**	1	0.308**
Information and communication technologies (ICT use)	0.082	0.359**	0.101*	0.318**	0.308**	1

*$p < 0.5$ and **$p < 0.01$.

degree of biasness. Statistical techniques were used to restrict CMV. First, a *post hoc* Harman's single factor test (Chang et al., 2010) was carried out with unrotated factor. The test reported 23% variance explained by the combined factor, which is lower than the recommended value of 50% (Podsakoff et al., 2003). Hence, it supported the fact that common method bias was not a considerable concern in this study. Furthermore, the accumulated variance explained by individual factors was 65%, which additionally vindicated the claim. Apart from this test, confirmatory factor analysis of the single factor was also conducted to trace the method biases, in case the data fits the hypothesized model (Malhotra et al., 2006). The poor fit of the data for the single factor substantiates the absence of CMV [χ^2/DF = 9.663, GFI = 0.281, AGFI = 0.229, normed fit index (NFI) = 0.262, incremental fit index (IFI) = 0.284, TLI = 0.247, RMR = 0.103, and RMSEA = 0.150]. We also employed the common latent factor (CLF) test. The standardized regression weights of the model with and without CLF were juxtaposed, and the deviations less than 25% gave credence to non-existence of CMV (Williams et al., 1989).

Descriptive Statistics

We calculated means, skewness, and kurtosis for all the six latent constructs. The descriptive statistics given below in **Table 2** indicate positive behavior of the items. The standard deviation (SD) has a range of values from 0.49584 to 0.76434; the mean value has also a range of values from 3.5631 to 4.3407, which is greater than the midpoint (2.5). Moreover, that data is distributed normally based on the values of skewness and kurtosis. The values of skewness and kurtosis were found within the range of normality, i.e., −1.0 to +1.0 for skewness, and for kurtosis less than 10 (Kline, 2010). Furthermore, we used the internal consistency approach (Cronbach's alpha) to assess the reliability of the scale. Kline and Walters (2016) suggested that the value of alpha with 0.7 or higher shows better reliability (see **Table 2**, for the corresponding values of variables of the study).

Similarly, a bivariate correlation analysis was carried out to analyze the strength and direction of the relationships. The results shown in **Table 3** indicate positive and significant correlations among ICT use, innovation, absorptive capacity, temporal leadership, corporate entrepreneurship, and competitive advantage.

Measurement Model

In evaluating the measurement model, factor analysis is a statistical technique that can be employed to analyze constructs in terms of their underlying factors (Hair et al., 2010). In this research, goodness of fit of the measurement model was examined through CMIN (χ^2), NFI, IFI, comparative fit index (CFI), GFI, and RMSEA. In order to achieve a model's suitability, the value of relative CMIN must be less than 5.0 (Bentler and Chou, 1987), and the value for our model is CMIN/*df* = 1.845, suggesting an acceptable fit for the model. The RMSEA value should be less than 0.08 for the data to be adopted (Schumacker and Lomax, 2004). Fortunately, this fit measure with the value of 0.047 also demonstrates goodness of fit of the model to the data. The model fitness has also been established with other indicators complying the threshold values as shown in **Table 4**.

Validity is another prerequisite for determining a measure's goodness after reliability analysis. The construct validity has

TABLE 4 | Model fit indicators.

Measure	Estimate	Threshold	Interpretation
CMIN	1713.867	–	–
df	929.000	–	–
CMIN/*df*	1.845	Between 1 and 3	Excellent
CFI	0.934	>0.95	Acceptable
SRMR	0.043	<0.08	Excellent
RMSEA	0.047	<0.06	Excellent
PClose	0.924	>0.05	Excellent

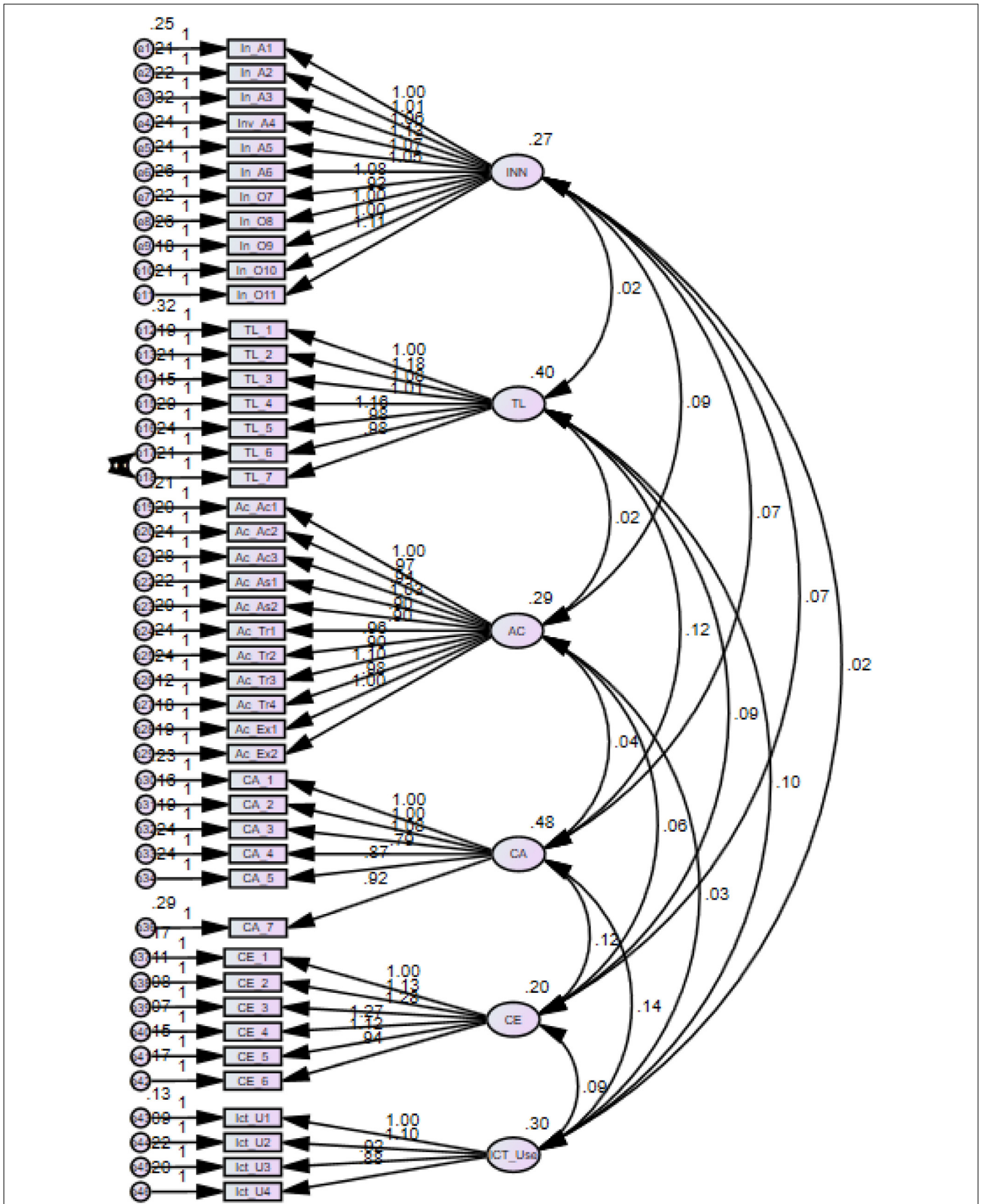

FIGURE 2 | Confirmatory factor analysis.

TABLE 5 | Average variance extracted (AVE) and discriminant validity.

	AVE	ICT use	Innovation	AC	CE	CEOs' TL	CA
ICT use	0.637	**0.798**					
Innovation	0.556	0.064	**0.746**				
AC	0.570	0.107	0.317	**0.755**			
CE	0.665	0.379	0.320	0.248	**0.816**		
CEOs' TL	0.660	0.301	0.070	0.050	0.341	**0.813**	
CA	0.650	0.363	0.203	0.120	0.378	0.280	**0.806**

For all the constructs, square roots of AVE (in bold) are shown as diagonal elements and interconstruct correlations as off-diagonal.

been established after conforming the convergent validity, discriminant validity, and face validity. These items were also measured and adopted in the past studies, so face validity was established. On the other hand, convergent validity was demonstrated by factor loadings and average variance of constructs extracted (AVE) with minimum criteria of cutoff as AVE > 0.5 (Al-Refaie, 2015). As shown in **Figure 2**, the CFA results indicate that all the items are significant with $p < 0.001$, and factor loadings are greater than 0.50. Similarly, all the constructs possess AVE value more than 0.5 (**Table 5**), thereby supporting the convergent validity. Discriminant validity, on the other hand, determines the magnitude of unique difference between measurements of different latent variables. It is measured by comparing the shared AVE of the square root of latent constructs' respective interconstruct correlation estimates. It can be seen from **Table 5** that square roots of AVE of all constructs in the diagonal are more than their corresponding interconstruct correlations. Therefore, the proposed measurement model exhibits discriminant validity.

Structural Model (Hypotheses Testing)

The regression estimates conducted through AMOS 24, shown in **Figure 3**, are summarized in **Table 6**. The overall fit measures for the regression model demonstrate that the model fits the data well (CMIN/*df* = 1.845, NFI = 0.867, TLI = 0.929, CFI = 0.934, GFI = 0.835, and RMSEA = 0.047).

The results in **Table 6** for hypothesis H_1 corroborate that information and communication technologies is positively related to corporate entrepreneurship. The values of the estimates are 0.259, the standard error is 0.051, *p*-value is significant at 0.000 level, while the critical ratio of ICT use on corporate entrepreneurship is 5.121. The results for H_2 (the estimate is 0.187, standard error is 0.040, *p*-value is significant at 0.000, and critical ratio is 4.667) demonstrate that innovation has a significant and positive impact on corporate entrepreneurship. The findings for hypothesis H_3 (estimate = 0.105, standard error = 0.041, critical ratio = 2.550, and *p*-value = 0.011) reveal that absorptive capacity significantly affects corporate entrepreneurship. In our analysis (estimate = 0.168, *p*-value = 0.000, standard error = 0.037, and critical ratio = 4.497), the results for hypothesis H_3 establish that temporal leadership has also a significant relation with corporate entrepreneurship.

The regression analysis has also computed estimated direct effects of predictors on competitive advantage. The estimated regression weight of ICT use (estimate = 0.345, *p*-value = 0.000, *SE* = 0.085, and CR = 4.074) on competitive advantage (H_6) shows that ICT use significantly influences competitive advantage. Similarly, innovation has shown a significant positive impact on competitive advantage (H_7) (estimate = 0.133, *p*-value = 0.043, *SE* = 0.066, and critical ratio = 2.028). The value of the direct effect of absorptive for hypothesis H_8 on competitive advantage is −0.003 and the *p*-value is insignificant (0.967), which indicates an insignificant relationship between absorptive capacity and competitive advantage. The results also suggest a significant relationship between temporal leadership and competitive advantage—hypothesis H_9 (estimate = 0.144, *p*-value = 0.019, and critical ratio = 2.338). Finally, the result for hypothesis H_5 also confirms that corporate entrepreneurship has a significant direct impact on competitive advantage (estimates = 0.326, standard error = 0.096, *p*-value = 0.000, and critical ratio = 3.404). With reference to H_{10}, there is an indirect effect of ICT use, innovation, absorptive capacity, and temporal leadership on competitive advantage through corporate entrepreneurship as a mediator. The significance values of the indirect relationships were determined in AMOS through bootstrapping procedure based on 2,000 bootstrap samples. The direct effects of ICT use, innovation, absorptive capacity, and temporal leadership on competitive advantage are 0.345, 0.133, −0.003, and 0.144, respectively, with *p*-values less than 0.05 except for the relationship of absorptive capacity. On the other hand, the corresponding indirect effects of ICT use, innovation, absorptive capacity, and temporal leadership on competitive advantage are 0.084, 0.061, 0.034, and 0.055 with *p*-values less than 0.05 showing that corporate entrepreneurship mediates all the relationships as reported in **Table 7**. In contrast, the strengths of mediating effects were determined by computing variance accounted for (VAF) value. The VAF value greater than 80% is considered to be full mediation, the value from 20 to 80% indicates partial mediation, while there was no mediation if the value is less than 20% (Hair et al., 2013). It can be observed from **Table 7** that all mediation effects are of medium level (VAF ≥ 20%), except for AC that has full mediation (VAF > 80%).

DISCUSSION

The proposed research model corroborates and expands the literature to correlate ICT use, innovation, absorptive capacity and CEO's temporal leadership with corporate entrepreneurship, and finally, with competitive advantage. Although the converse relationships are also possible (Bollen and Pearl, 2013), the discussion is limited to only one-sided relationships due to stipulated frame of work. The outcomes of H_1 through H_4 establish the relevance of predictors as enablers of corporate entrepreneurship. These remarkable effects suggest that by investing in ICT use, innovation, absorptive capacity, and CEO's temporal leadership, IT firms can own ingredients of good corporate entrepreneurship. The results established here are in agreement with previous studies. For example, the results of

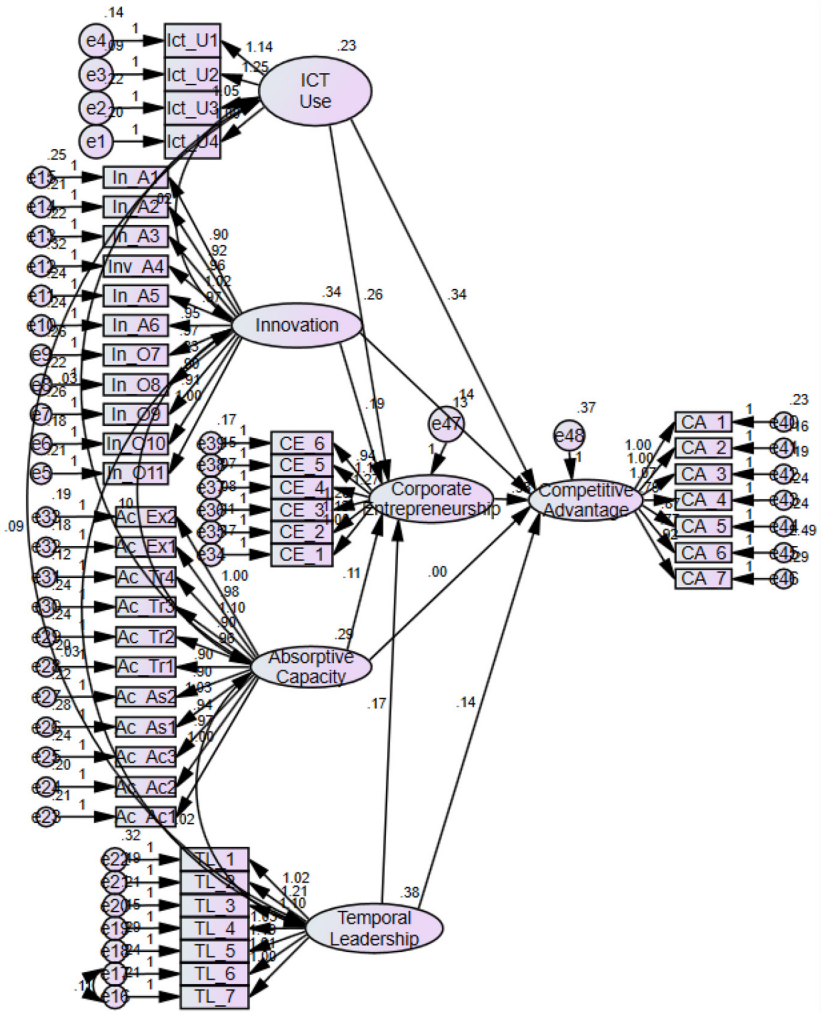

FIGURE 3 | Regression estimates structural models.

H_1 (β = 0.259, *p*-value < 0.001) are supported by Hosseini et al. (2014) and Tang et al. (2015), who concluded that the relationship between ICT and corporate entrepreneurship is significant. Similarly, innovation and corporate entrepreneurship (H_2) show a positive and significant relationship (β = 0.187, *p*-value < 0.001). This result is corroborated by the findings of Martín-Rojas et al. (2017). On the other hand, the results supporting H_3 (β = 0.105, *p*-value = 0.011) reveal that absorptive capacity is significantly and positively related to corporate entrepreneurship. The finding is similar to the conclusion made by García-Sánchez et al. (2018). Likewise, similar to the results for H_4 (β = 0.168, *p*-value < 0.001), Maruping et al. (2015) have proposed the identical findings substantiating the relationship between CEO's temporal leadership and corporate entrepreneurship. These relationships then converge on the competitive advantage through corporate entrepreneurship (H_5). The empirical positive results (β = 0.326, *p*-value < 0.000) are ratified by the findings of previous research work (Daryani and Karimi, 2017; Prange and Pinho, 2017). It validates that effective employment of corporate entrepreneurship contributes toward fostering competitive advantage. It is organizational capability and situation used as a resource to achieve competitive advantage (Stevens et al., 2015). It is also an activity of firm's capabilities to achieve the desired result (Stevens et al., 2015).

TABLE 6 | Direct effects of the structural model.

Hypothesis	Path	β	SE	CR	p	Result
H_1	CE ← ICT use	0.259	0.051	5.121	***	Supported
H_2	CE ← INN	0.187	0.04	4.677	***	Supported
H3	CE ← AC	0.105	0.041	2.55	0.011	Supported
H4	CE ← TL	0.168	0.037	4.497	***	Supported
H_5	CA ← CE	0.326	0.096	3.404	***	Supported
H_6	CA ← ICT use	0.345	0.085	4.074	***	Supported
H_7	CA ← INN	0.133	0.066	2.028	0.043	Supported
H_8	CA ← AC	−0.003	0.068	−0.042	0.967	Not supported
H_9	CA ← TL	0.144	0.062	2.338	0.019	Supported

****p < 0.001.*

TABLE 7 | Indirect effects (mediation) obtained through bootstrapping.

Hypothesis	Path			β	VAF = effects (indirect/total) %	p	Result
H_{10-A}	CA	←	CE ← ICT use	0.084	20%	0.005	Partial mediation
H_{10-B}	CA	←	CE ← INN	0.061	31%	0.002	Partial mediation
H_{10-C}	CA	←	CE ← AC	0.034	92%	0.003	Full mediation
H_{10-D}	CA	←	CE ← TL	0.055	28%	0.002	Partial mediation

Furthermore, the direct effects of the predictors, i.e., ICT use, innovation, absorptive capacity, and CEO's temporal leadership on competitive advantage as the outcome, have been explained under hypotheses H_6, H_7, H_8, and H_9, respectively. The corresponding results ($\beta = 0.345$, p-value < 0.000; $\beta = 0.133$, p-value $= 0.045$; $\beta = -0.003$, p-value $= 0.967$; $\beta = 0.144$, p-value $= 0.019$) are consistent with the relevant previous studies. The results suggest that all these variables show positive and significant impact on competitive advantage, except absorptive capacity that does not impact the competitive advantage directly. Managing resources of ICT for enhancing the firm performance and attaining competitive advantage requires a firm culture, which may help in identifying, making, and assessing these opportunities (Agarwal and Brem, 2015). The effective use of ICT contributes toward the successful organization and competitive advantage (Manochehri et al., 2012). In the same way, innovation can transform information and communication technology resources, the firm's practices, and explicit and tacit knowledge into beneficial capabilities, initiatives, and resources; therefore, competitive advantage can be achieved through innovation (Agarwal and Brem, 2015). In addition, absorptive capacity helps attain competitive advantage through exploitation and exploration that enhances market share, sale of firm, and profitability than the other companies (Martín-Rojas et al., 2013). On the contrary, our results suggest that this effect is exploitable through corporate entrepreneurship instead of its direct applicability.

On the other hand, all the indirect effects are significant and positive, as reported in **Table 7**. Encapsulating, based upon the empirical evidences, corporate entrepreneurship partially mediates the relationships of ICT use (H_{10-A}), innovation (H_{10-B}), and CEO's temporal leadership (H_{10-C}) with competitive advantage to the extent of 20, 31, and 28%, respectively. On the other hand, CE fully mediates between absorptive capacity and competitive advantage (H_{10-D}) achieving the magnitude of 92%. It implies that absorptive capacity can be exploited to achieve competitive advantage meaningfully only through venturing entrepreneurship at the corporate level. Thus, we confirm that ICT, innovation, absorptive capacity, and temporal leadership coupled with corporate entrepreneurship help develop entrepreneurial activities, and their upshots attain more competitive advantage and ambitious goals.

MANAGERIAL IMPLICATIONS

In this study, we emphasize the pivotal role played by strategic resources such as information and communication technologies, innovation, absorptive capacity, temporal leadership, and corporate entrepreneurship to better seize the opportunities in enhancing the firms' competitiveness. At the practical level, this study has implications for managers, entrepreneurs, innovation adopters, and technology suppliers to better understand and transform dynamic capabilities and value creation resources into competitive advantage, which may further help them face global challenges. Our results have significance for policy makers as well, who may formulate policies that foster a culture of corporate entrepreneurship, and provide facilitating conditions such as entrepreneurial education, training, and an enabling environment to better exploit the opportunities offered by ICT, absorptive capacity, temporal leadership, and innovation. It may also enable firms to identify their strengths and weaknesses for increasing long-term competitiveness and profitability. Firms that have absorptive capacity can interact with the external environment innovatively to access external knowledge necessary for generating new product ideas to help attain additional competitive advantage. Consequently, this would produce a ripple effect in the form of jobs creation, greater exports, reduced imports, and growth in national GDP. In a nutshell, we suggest that corporate entrepreneurship channelizes the parameters required to reap the advantages of opportunities for an organization.

On the social front, this study can improve the quality of life of the poor by offering people with equal opportunities who face difficulties. Organizations can foster their personnel's entrepreneurial skills through trainings, workshops, mentoring, and motivation to further strengthen the organization. By adopting corporate entrepreneurship, managers can increase job opportunities by creating new markets with its impact on human resources and long-term competitive advantage. The growth and exports of any country considerably depend on companies' competitiveness that are operating in the country. Consequently, countries can benefit from the competitiveness and innovative activities of the companies by implementing polices that incentivize them.

CONCLUSION

Today's information age and globalized environment reveal contemporary challenges that cannot be underrated. Despite these challenges, many opportunities can be gained through the proper use of resources for sustaining competitive advantage. ICT, innovation, absorptive capacity, and temporal leadership are strategic resources of an organization that play their role to achieve competitive advantage. However, these potential benefits can be realized in an environment fostered by

entrepreneurial spirit. This paper asserts that ICT, absorptive capacity, temporal leadership, and innovation have a positive impact on competitiveness of an organization if opportunities are managed within the culture of an organization through corporate entrepreneurship. In this way, firms not only can maintain their present competitive advantage but also can cope with challenges and threats by exploiting new opportunities. The results are established on SEM analysis conducted on data collected from 460 IT firms through attitudinal measures of scale. According to the regression results, ICT use, innovation, absorptive capacity, and CEO's temporal leadership show significant direct and indirect impacts on competitive advantage through corporate entrepreneurship. These results are consistent with past studies conducted by various researchers [e.g., Manochehri et al. (2012); Hosseini et al. (2014), Agarwal and Brem (2015); Tang et al. (2015)].

The study has several implications for managers, entrepreneurs, innovation adopters, and technology suppliers to better understand and transform dynamic capabilities and value creation resources into competitive advantage, which may further help them face global challenges. Managers can make use of these significant elements to help maintain competitive advantage and for the creation of wealth, increase in sales, and growth of market share. It also has significance for policy makers, who may formulate policies that foster a culture of corporate entrepreneurship and provide facilitating conditions such as entrepreneurial education, training, and an enabling environment to better exploit the opportunities offered by ICT, absorptive capacity temporal leadership, and innovation. It may also assist firms to identify their strengths and weaknesses for increasing long-term competitiveness and profitability. Firms that have absorptive capacity can interact with the external environment innovatively to access external knowledge necessary for generating new product ideas to help attain additional competitive advantage. Consequently, this would produce a ripple effect in the form of jobs creation, greater exports, reduced imports, and growth in national GDP.

In spite of several contributions, the present study has some limitations that may turn out to be an opportunity for further research. First, the data were collected through convenient sampling in one district of Lahore, which limits the generalizability of the results. The prospective research should be performed using a more representative probabilistic sampling technique and collecting data from other IT hubs of the country. Likewise, the proposed model or its adaptation may be cross-checked for its reliability in other entrepreneurial sectors. Moreover, granted that common method bias was not a perceptible issue, we still emphasize on applying alternative solutions to address this concern. Another point for the prospective work is to test endogeneity to detect endogenous regressors through the Hausman test.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.531886/full#supplementary-material

REFERENCES

Agarwal, N., and Brem, A. (2015). Strategic business transformation through technology convergence: implications from General Electric's industrial internet initiative. *Int. J. Technol. Manag.* 67, 196–214. doi: 10.1504/ijtm.2015.068224

Agarwal, R., and Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Inf. Syst. Res.* 9, 204–215. doi: 10.1287/isre.9.2.204

Ali, M., Kan, K. A. S., and Sarstedt, M. (2016). Direct and configurational paths of absorptive capacity and organizational innovation to successful organizational performance. *J. Bus. Res.* 69, 5317–5323. doi: 10.1016/j.jbusres.2016.04.131

Ali, M., and Park, K. (2016). The mediating role of an innovative culture in the relationship between absorptive capacity and technical and non-technical innovation. *J. Bus. Res.* 69, 1669–1675. doi: 10.1016/j.jbusres.2015.10.036

Alipour, K. K., Mohammed, S., and Martinez, P. N. (2017). Incorporating temporality into implicit leadership and followership theories: exploring inconsistencies between time-based expectations and actual behaviors. *Leadersh. Q.* 28, 300–316. doi: 10.1016/j.leaqua.2016.11.006

Al-Refaie, A. (2015). Effects of human resource management on hotel performance using structural equation modeling. *Comput. Hum. Behav.* 43, 293–303. doi: 10.1016/j.chb.2014.11.016

Amankwah-Amoah, J. (2016). An integrative process model of organisational failure. *J. Bus. Res.* 69, 3388–3397. doi: 10.1016/j.jbusres.2016.02.005

Andersen, T. K. (2015). Employees' involuntary non-use of ICT influenced by power differences: a case study with the grounded theory approach. *Interdiscip. J. Inform. Knowledge Manage.* 10, 117–143. doi: 10.28945/2279

Audretsch, D. B., Lehmann, E. E., and Wright, M. (2014). Technology transfer in a global economy. *J. Technol. Transf.* 39, 301–312. doi: 10.1007/s10961-012-9283-6

Baum, J. R., Freese, M., and Baron, R. A. (2007). *The Psychology of Entrepreneurship*. Mahwah, NJ: Lawrence Erlbaum Associates.

Belderbos, R., Gilsing, V. A., and Suzuki, S. (2016). Direct and mediated ties to universities: "Scientific" absorptive capacity and innovation performance of pharmaceutical firms. *Strateg. Organ.* 14, 32–52. doi: 10.1177/1476127015604734

Ben-Oz, C., and Greve, H. R. (2015). Short-and long-term performance feedback and absorptive capacity. *J. Manag.* 41, 1827–1853. doi: 10.1177/0149206312466148

Bentler, P. M., and Chou, C. P. (1987). Practical issues in structural modeling. *Sociol. Methods Res.* 16, 78–117. doi: 10.1177/0049124187016001004

Bharati, P., Zhang, C., and Chaudhury, A. (2014). Social media assimilation in firms: investigating the roles of absorptive capacity and institutional pressures. *Inf. Syst. Front.* 16, 257–272. doi: 10.1007/s10796-013-9433-x

Blurton, C. (2005). *New Direction of Use in Education*. Available online at: http://www.unesco.org/education/echicprog/inst/edict.pd/ (accessed May 2005).

Bojica, A. M., and Fuentes, M. D. M. F. (2012). Knowledge acquisition and corporate entrepreneurship: insights from Spanish SMEs in the ICT sector. *J. World Bus.* 47, 397–408. doi: 10.1016/j.jwb.2011.05.007

Bollen, K. A., and Pearl, J. (2013). "Eight myths about causality and structural equation models," in *Handbook of Causal Analysis for Social Research*, ed. S. Morgan (Dordrecht: Springer), 301–328. doi: 10.1007/978-94-007-6094-3_15

Bridoux, F., Smith, K. G., and Grimm, C. M. (2013). The management of resources: temporal effects of different types of actions on performance. *J. Manag.* 39, 928–957. doi: 10.1177/0149206311426188

Burgers, J. H., and Covin, J. G. (2016). The contingent effects of differentiation and integration on corporate entrepreneurship. *Strateg. Manag. J.* 37, 521–540. doi: 10.1002/smj.2343

Busenitz, L. W., Plummer, L. A., Klotz, A. C., Shahzad, A., and Rhoads, K. (2014). *Entrepreneurship Research (1985–2009) and the Emergence of Opportunities*. Los Angeles, CA: SAGE Publications.

Byrne, B. (2001). *SEM with AMOS: Basic Concepts, Applications, and Programming*. Abingdon: Routledge.

Carlton, D. (2014). "Three reasons government tech projects fail," in *Gartner Application Architecture, Development and Integration Summit*, Sydney, 21–22.

Cepeda-Carrion, G., Cegarra-Navarro, J. G., and Jimenez-Jimenez, D. (2012). The effect of absorptive capacity on innovativeness: context and information systems capability as catalysts. *Br. J. Manag.* 23, 110–129.

Chang, C. H., Chen, Y. S., and Lin, M. J. J. (2014). Determinants of absorptive capacity: contrasting manufacturing vs services enterprises. *R D Manag.* 44, 466–483. doi: 10.1111/radm.12086

Chang, S. J., Van Witteloostuijn, A., and Eden, L. (2010). From the editors: common method variance in international business research. *J. Int. Bus. Stud.* 41, 178–184. doi: 10.1057/jibs.2009.88

Chen, J., and Nadkarni, S. (2017). It's about time! CEOs' temporal dispositions, temporal leadership, and corporate entrepreneurship. *Adm. Sci. Q.* 62, 31–66. doi: 10.1177/0001839216663504

Chen, S., Bu, M., Wu, S., and Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *J. Bus. Res.* 68, 1127–1135. doi: 10.1016/j.jbusres.2014.11.002

Chen, Y., Wang, Y., Nevo, S., Benitez-Amado, J., and Kou, G. (2015). IT capabilities and product innovation performance: the roles of corporate entrepreneurship and competitive intensity. *Inf. Manag.* 52, 643–657. doi: 10.1016/j.im.2015.05.003

Cohen, J. F., and Olsen, K. (2015). Knowledge management capabilities and firm performance: a test of universalistic, contingency and complementarity perspectives. *Expert Syst. Appl.* 42, 1178–1188. doi: 10.1016/j.eswa.2014.09.002

Covin, J. G., Green, K. M., and Slevin, D. P. (2006). Strategic process effects on the entrepreneurial orientation–sales growth rate relationship. *Entrep. Theory Pract.* 30, 57–81. doi: 10.1111/j.1540-6520.2006.00110.x

Daryani, M. A., and Karimi, A. (2017). Effect of corporate entrepreneurship on firm performance in Iranian ASMEs: the mediation role of knowledge creation and learning orientation. *J. Agric. Sci. Technol.* 19, 261–277.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13, 319–340.

de Jong, J. P. (2013). The decision to exploit opportunities for innovation: a study of high–tech small–business owners. *Entrep. Theory Pract.* 37, 281–301. doi: 10.1111/j.1540-6520.2011.00459.x

Espejo, R., and Dominici, G. (2017). Cybernetics of value cocreation for product development. *Syst. Res. Behav. Sci.* 34, 24–40. doi: 10.1002/sres.2392

Forés, B., and Camisón, C. (2016). Does incremental and radical innovation performance depend on different types of knowledge accumulation capabilities and organizational size? *J. Bus. Res.* 69, 831–848. doi: 10.1016/j.jbusres.2015.07.006

García-Morales, V. J., Bolívar-Ramos, M. T., and Martín-Rojas, R. (2014). Technological variables and absorptive capacity's influence on performance through corporate entrepreneurship. *J. Bus. Res.* 67, 1468–1477. doi: 10.1016/j.jbusres.2013.07.019

García-Sánchez, E., García-Morales, V. J., and Martín-Rojas, R. (2018). Analysis of the influence of the environment, stakeholder integration capability, absorptive capacity, and technological skills on organizational performance through corporate entrepreneurship. *Int. Entrep. Manag. J.* 14, 345–377. doi: 10.1007/s11365-017-0436-9

Gartner (2012). *Worldwide Spending on Enterprise Application Software to Increase 4.5 percent in 2012*. New York, NY: Business Wire.

Gatignon, H., Tushman, M. L., Smith, W., and Anderson, P. (2002). A structural approach to assessing innovation: construct development of innovation locus, type, and characteristics. *Manage. Sci.* 48, 1103–1122.

Gorgievski, M. J., and Stephan, U. (2016). Advancing the psychology of entrepreneurship: a review of the psychological literature and an introduction. *Appl. Psychol.* 65, 437–468. doi: 10.1111/apps.12073

Haghighi, N. F., Hajihoseini, H., Nargesi, G. R., and Bijani, M. (2018). Gap analysis of current and desired states of entrepreneurship development components in the field of ICTs in Iran. *Technol. Soc.* 54, 101–110. doi: 10.1016/j.techsoc.2018.03.003

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hair, J. F., Hut, G. T. M., Ringle, C. M., and Sarstedt, M. (2013). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks, CA: Sage.

Hosseini, F., Lashgaara, F., and Hosseini, S. F. (2014). The role of ICT in entrepreneurship development from experts view of agriculture organization of Tehran. *Bull. Environ. Pharmacol. Life Sci.* 4, 152–156.

Hurmelinna-Laukkanen, P., Olander, H., Blomqvist, K., and Panfilii, V. (2012). Orchestrating RandD networks: absorptive capacity, network stability, and innovation appropriability. *Eur. Manag. J.* 30, 552–563. doi: 10.1016/j.emj.2012.03.002

Igun, S. E. (2014). Strategic impact of ICT on modern day banking in Nigeria. *Int. J. Strateg. Inf. Technol. Appl.* 5, 78–93. doi: 10.4018/ijsita.2014100105

Jacobs, A. J. (2012). *Information System Implementations: Using a Leadership Quality Matrix for Success: System Implementations, Gain Significant Momentum, an Insiders Guide to What You Need to Know*. Bloomington, IN: AuthorHouse.

Jarrar, N. S., and Smith, M. (2014). Innovation in entrepreneurial organisations: a platform for contemporary management change and a value creator. *Br. Account. Rev.* 46, 60–76. doi: 10.1016/j.bar.2013.07.001

Jiménez-Barrionuevo, M., Molina, L. M., and García-Morales, V. J. (2019). Combined influence of absorptive capacity and corporate entrepreneurship on performance. *Sustainability* 11, 3034–3060. doi: 10.3390/su11113034

Kline, R. (2010). *Principles and Practice of Structural Equation Modeling*. New York, NY: Guilford Press.

Kline, P., and Walters, C. R. (2016). Evaluating public programs with close substitutes: the case of Head Start. *Q. J. Econ.* 131, 1795–1848. doi: 10.1093/qje/qjw027

Kuratko, D. F., and Audretsch, D. B. (2013). Clarifying the domains of corporate entrepreneurship. *Int. Entrep. Manag. J.* 9, 323–335. doi: 10.1007/s11365-013-0257-4

Kuratko, D. F., Covin, J. G., and Hornsby, J. S. (2014). Why implementing corporate innovation is so difficult. *Bus. Horiz.* 57, 647–655.

Kuratko, D. F., Hornsby, J. S., and Hayton, J. (2015). Corporate entrepreneurship: the innovative challenge for a new global economic reality. *Small Bus. Econ.* 45, 245–253. doi: 10.1007/s11187-015-9630-8

Leal-Rodríguez, A. L., Eldridge, S., Roldán, J. L., Leal-Millán, A. G., and Ortega-Gutiérrez, J. (2015). Organizational unlearning, innovation outcomes, and performance: the moderating effect of firm size. *J. Bus. Res.* 68, 803–809. doi: 10.1016/j.jbusres.2014.11.032

Liao, W. C., Tseng, C. C., and Ho, M. H. C. (2015). The effects of integrating innovative resources on organisational performance: the moderating role of innovation life cycle. *Int. J. Technol. Manag.* 67, 215–244. doi: 10.1504/ijtm.2015.068220

Lusch, R. F., and Nambisan, S. (2015). Service innovation: a service-dominant logic perspective. *MIS Q.* 39, 155–176.

Malaquias, R. F., Malaquias, F. F., and Hwang, Y. (2016). Effects of information technology on corporate social responsibility: empirical evidence from an emerging economy. *Comput. Hum. Behav.* 59, 195–201. doi: 10.1016/j.chb.2016.02.009

Malhotra, N. K., Kim, S. S., and Patil, A. (2006). Common method variance in IS research: a comparison of alternative approaches and a reanalysis of past research. *Manage. Sci.* 52, 1865–1883. doi: 10.1287/mnsc.1060.0597

Manochehri, N. N., Al-Esmail, R. A., and Ashrafi, R. (2012). Examining the impact of information and communication technologies (ICT) on enterprise practices: a preliminary perspective from Qatar. *Electron. J. Inf. Syst. Dev. Ctries.* 51, 1–16. doi: 10.1002/j.1681-4835.2012.tb00360.x

Martín-Rojas, R., Fernández-Pérez, V., and García-Sánchez, E. (2017). Encouraging organizational performance through the influence of technological distinctive competencies on components of corporate entrepreneurship. *Int. Entrep. Manag. J.* 13, 397–426. doi: 10.1007/s11365-016-0406-7

Martín-Rojas, R., García-Morales, V. J., and Bolívar-Ramos, M. T. (2013). Influence of technological support, skills and competencies, and learning on corporate entrepreneurship in European technology firms. *Technovation* 33, 417–430. doi: 10.1016/j.technovation.2013.08.002

Martín-Rojas, R., García-Morales, V. J., and García-Sánchez, E. (2011). The influence on corporate entrepreneurship of technological variables. *Ind. Manag. Data Syst.* 111, 984–1005. doi: 10.1108/02635571111161253

Martin-Rojas, R., Garcia-Morales, V. J., and Gonzalez-Alvarez, N. (2019). Technological antecedents of entrepreneurship and its consequences for organizational performance. *Technol. Forecast. Soc. Change* 147, 22–35. doi: 10.1016/j.techfore.2019.06.018

Maruping, L. M., Venkatesh, V., Thatcher, S. M., and Patel, P. C. (2015). Folding under pressure or rising to the occasion? Perceived time pressure and the moderating role of team temporal leadership. *Acad. Manag. J.* 58, 1313–1333. doi: 10.5465/amj.2012.0468

Mazzei, M. J., Ketchen, D. J., and Shook, C. L. (2017). Understanding strategic entrepreneurship: a "theoretical toolbox" approach. *Int. Entrep. Manag. J.* 13, 631–663. doi: 10.1007/s11365-016-0419-2

McDougall, P. P., Shane, S., and Oviatt, B. M. (1994). Explaining the formation of international new ventures: the limits of theories from international business research. *J. Bus. Venturing* 9, 469–487.

McFadzean, E., O'Loughlin, A., and Shaw, E. (2005). Corporate entrepreneurship and innovation part 1: the missing link. *Eur. J. Innov. Manage.* 8, 350–372.

Miralles, F., Giones, F., and Riverola, C. (2016). Evaluating the impact of prior experience in entrepreneurial intention. *Int. Entrep. Manage. J.* 12, 791–813. doi: 10.1007/s11365-015-0365-4

Mohammed, S., and Alipour, K. K. (2014). It's time for temporal leadership: individual, dyadic, team, and organizational effects. *Ind. Organ. Psychol.* 7, 178–182. doi: 10.1111/iops.12128

Mohammed, S., and Nadkarni, S. (2011). Temporal diversity and team performance: the moderating role of team temporal leadership. *Acad. Manag. J.* 54, 489–508. doi: 10.5465/amj.2011.61967991

Mortara, L., Napp, J., Ford, S., and Minshall, T. (2011). "Open innovation activities to foster corporate entrepreneurship," in *Entrepreneurship and Technological Change*, eds L. Cassia, T. Minola, and S. Paleari (Cheltenham: Edward Elgar).

Mostafiz, M. I. (2020). The antecedents and the outcomes of a firm's dominant logic-the dynamic managerial capability perspective. *J. Int. Bus. Entrep. Dev.* 12, 142–155. doi: 10.1504/jibed.2020.106183

Najafi Tavani, S., Sharifi, H., Soleimanof, S., and Najmi, M. (2013). An empirical study of firm's absorptive capacity dimensions, supplier involvement and new product development performance. *Int. J. Prod. Res.* 51, 3385–3403. doi: 10.1080/00207543.2013.774480

Otache, I., and Mahmood, R. (2015). Corporate entrepreneurship and business performance: the role of external environment and organizational culture: a proposed framework. *Mediterr. J. Soc. Sci.* 6, 524–531.

Pagano, D., and Brügge, B. (2013). "User involvement in software evolution practice: a case study," in *Proceedings of the 35th International Conference on Software Engineering (ICSE)*, (San Francisco, CA: IEEE), 953–962.

Pallant, J. (2005). *SPSS Survival Manual: A Step Guide to Data Analysis Using SPSS for Windows Version 12*. Chicago, IL: Open University Press.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88:879. doi: 10.1037/0021-9010.88.5.879

Prange, C., and Pinho, J. C. (2017). How personal and organizational drivers impact on SME international performance: the mediating role of organizational innovation. *Int. Bus. Rev.* 26, 1114–1123. doi: 10.1016/j.ibusrev.2017.04.004

Ramos-González, M., Rubio-Andrés, M., and Sastre-Castillo, M. Á. (2017). Building corporate reputation through sustainable entrepreneurship: the mediating effect of ethical behavior. *Sustainability* 9, 1663–1682. doi: 10.3390/su9091663

Rangus, K., and Slavec, A. (2017). The interplay of decentralization, employee involvement and absorptive capacity on firms' innovation and business performance. *Technol. Forecast. Soc. Change* 120, 195–203. doi: 10.1016/j.techfore.2016.12.017

Rehman, N., Razaq, S., Farooq, A., Zohaib, N. M., and Nazri, M. (2020). Information technology and firm performance: mediation role of absorptive capacity and corporate entrepreneurship in manufacturing SMEs. *Technol. Anal. Strategic Manage.* 32, 1–17. doi: 10.1080/09537325.2020.1740192

Rogers, E. M. (1995). *Diffusion of Innovations: Modifications of a Model for Telecommunications. In Die Diffusion von Innovationen in der Telekommunikation*. Berlin: Springer, 25–38.

Salamzadeh, A., and Kirby, D. A. (2017). New venture creation: how start-ups grow? *AD Minist.* 30, 9–29. doi: 10.17230/ad-minister.30.1

Saran, C. (2012). *Almost a Third of BI Projects Fail to Deliver on Business Objectives*. London: Computer Weekly.

Sarooghi, H., Libaers, D., and Burkemper, A. (2015). Examining the relationship between creativity and innovation: a meta-analysis of organizational, cultural, and environmental factors. *J. Bus. Ventur.* 30, 714–731. doi: 10.1016/j.jbusvent.2014.12.003

Schumacker, R. E., and Lomax, R. G. (2004). *A Beginner's Guide to Structural Equation Modeling*. East Sussex: Psychology press.

Shah Alam, S., Ali, M. Y., and Mohd Jani, M. F. (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. *J. Bus. Econ. Manag.* 12, 375–399. doi: 10.3846/16111699.2011.576749

Shimizu, K. (2012). Risks of corporate entrepreneurship: autonomy and agency issues. *Organ. Sci.* 23, 194–206. doi: 10.1287/orsc.1110.0645

Standifer, R. L., Raes, A. M., Peus, C., Passos, A. M., Santos, C. M., and Weisweiler, S. (2015). Time in teams: cognitions, conflict and team satisfaction. *J. Manag. Psychol.* 30, 692–708. doi: 10.1108/jmp-09-2012-0278

Staniewski, M. W. (2016). The contribution of business experience and knowledge to successful entrepreneurship. *J. Bus. Res.* 69, 5147–5152.

Stevens, R., Moray, N., Bruneel, J., and Clarysse, B. (2015). Attention allocation to multiple goals: the case of for-profit social enterprises. *Strateg. Manag. J.* 36, 1006–1016. doi: 10.1002/smj.2265

Szirmai, A., Naudé, W., and Alcorta, L. (eds.) (2013). *Pathways to Industrialization in the Twenty-first Century: New Challenges and Emerging Paradigms*. Oxford: OUP Oxford.

Tang, G., Chen, Y., and Jin, J. (2015). Entrepreneurial orientation and innovation performance: roles of strategic HRM and technical turbulence. *Asia Pac. J. Hum. Resour.* 53, 163–184. doi: 10.1111/1744-7941.12053

Urban, B., and Wood, E. (2015). The importance of opportunity recognition behaviour and motivators of employees when engaged in corporate entrepreneurship. *J. Bus. Econ. Manag.* 16, 980–994. doi: 10.3846/16111699.2013.799087

Urbano, D., and Turró, A. (2013). Conditioning factors for corporate entrepreneurship: an in (ex) ternal approach. *Int. Entrep. Manag. J.* 9, 379–396. doi: 10.1007/s11365-013-0261-8

van Laar, E., van Deursen, A. J., van Dijk, J. A., and de Haan, J. (2017). The relation between 21st-century skills and digital skills: a systematic literature review. *Comput. Hum. Behav.* 72, 577–588. doi: 10.1016/j.chb.2017.03.010

Venturi, F. (2015). The modern drivers of productivity. *Res. Policy* 44, 357–369. doi: 10.1016/j.respol.2014.10.011

Williams, L., Cote, J., Buckley, M., and Ronald, M. (1989). Lack of method variance in self-reported affect and perceptions at work: reality or artifact? *J. Appl. Psychol.* 74, 462–468. doi: 10.1037/0021-9010.74.3.462

Xie, X., Zou, H., and Qi, G. (2018). Knowledge absorptive capacity and innovation performance in high-tech companies: a multi-mediating analysis. *J. Bus. Res.* 88, 289–297. doi: 10.1016/j.jbusres.2018.01.019

Yunis, M., El-Kassar, A.-N., and Tarhini, A. (2017). Impact of ICT-based innovations on organizational performance: the role of corporate entrepreneurship. *J. Enterp. Inf. Manag.* 30, 122–141. doi: 10.1108/jeim-01-2016-0040

Yunis, M., Tarhini, A., and Kassar, A. (2018). The role of ICT and innovation in enhancing organizational performance: the catalysing effect of corporate entrepreneurship. *J. Bus. Res.* 88, 344–356. doi: 10.1016/j.jbusres.2017.12.030

Zahra, S. A. (1996). Goverance, ownership, and corporate entrepreneurship: the moderating impact of industry technological opportunities. *Acad. Manag. J.* 39, 1713–1735. doi: 10.5465/257076

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Financial Sustainability and Corporate Social Responsibility Under Mediating Effect of Operational Self-Sustainability

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Operational and financial sustainability have, over time, remained as issues in the microfinance industry. The microfinance industry is struggling to gain self-sufficiency in Pakistan due to non-performing loans and operating costs. Simultaneously, deliberation on corporate social responsibility (CSR) is also considered in academic literature and organizational practices. However, studies on CSR and financial performance in the microfinance sector are scarce, especially in Pakistan. CSR will develop customer attraction and loyalty, employee attraction, motivation and commitment, MFIs' reputation and access to capital, and eventually build financial performance. Interviews were conducted with branch managers of microfinance institutions to test previous questionnaires. A self-administered survey was conducted to collect data from the managers of the microfinance banks operating in Punjab. Descriptive and inferential statistics were performed to answer research questions using Smart PLS. Most of the microfinance institutions believe in social responsibilities but lacks fund allocation and approval from higher management, and results are in line with prior studies. These empirical findings lead to the perception that CSR is not a barrier performance in microfinance banks as they have access to capital. The results indicated a strong positive correlation between CSR and the financial performance of the MFIs. CSR also positively correlates with customer retention, employees' motivation and attraction, and business reputation. CSR was associated with access to capital but was found to be weak. The research also narrated the limitation and practical implications of the study. The study also discusses further research directions.

Keywords: stakeholder theory, financial sustainability, corporate social (ir)responsibility, operational self-sustainability, microfinance

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INTRODUCTION

The microfinance sector has gained attention in the last decade. Microfinance institutions (MFIs) provide microloans to the poor at their doorstep, which is costly and is the main hurdle in operational sustainability. Corporate social responsibility is a further added pressure on these MFIs to gain OSS and financial sustainability. Financial performance is the key to the future expansion

of any enterprise. Financial sustainability (FS) is obtained through operational self-sustainability (OSS). It means that enterprises can only be financially sustainable if these are operationally economical (Hudon and Traca, 2011). Corporate social responsibility increases the share price and provides signals to prospective investors (Godfrey et al., 2009; Yang and Suvd, 2017; Hussain et al., 2020a,b). The debacle of corporate social responsibility (CSR) have been well-established in developed economies for the last three decades (Cochran and Wood, 1984; Torugsa et al., 2012), but remains a lively debate in emerging nations (Islam et al., 2017). A firm's CSR and financial performance are widely tested, but researchers do not agree on the same points, in terms of these variables' association. Prior studies were conducted to review the relationship between CSR and FS but no conclusive evidence could be found, nor could a consensus be reached on the nature of the relationship (Cochran and Wood, 1984; McWilliams and Siegel, 2000; Fauzi and Idris, 2009; Lin et al., 2009; Tang et al., 2012; Abdelkbir and Faiçal, 2015; Jiang and Yang, 2015; Akben Selcuk and Kiymaz, 2017).

Corporate social responsibility is still an essential issue for the microfinance sector as the social impact can only be achieved through outreach (Woller, 2007; Shu and Oney, 2014; Nurmakhanova et al., 2015; Cho et al., 2019). Targeting low income customers is the primary concern for large and sustainable MFIs (Thomas and Jyothi, 2016). Therefore, MFIs have to invest resources in social performance that distract MFIs from core objectives of profitability and operational and financial sustainability (Woller, 2007; Nurmakhanova et al., 2015; Naz et al., 2019). The target for financial sustainability puts pressure on the MFIs to distract CRS and to target easier-to-reach rich customers to reduce the default risk. This action will result in dislodging from a mission to provide services to the unbanked. On the other hand, CSR will increase social roots, customers' loyalty, poverty alleviation, employee attraction, and access to capital (Cochran and Wood, 1984; Woller, 2007; Sweeney, 2009; Naz et al., 2019). Thus, MFIs have to trade-off between CSR and financial self-sufficiency (Nurmakhanova et al., 2015).

The paper contributes to prior research in three areas. The mediating effect of operational self-sustainability is ignored, which is more significant in the microfinance industry as it has a higher operating cost than conventional banking (Naz et al., 2019). CSR in microfinance institutions (MFIs) is more important than any other industry as MFIs receive donations from donors to enhance outreach and social projects (Sweeney, 2009). Finally, CSR and financial performance are mostly tested through secondary data based on historical data (Abdelkbir and Faiçal, 2015; Manokaran et al., 2018). The current study used primary data obtained from the managers [consistent with prior studies of Sweeney (2009)] of the larger pool of MFIs to find the relationship between CSR and financial sustainability.

The research paper's sequence includes the theory and hypothesis development of financial sustainability, operational self-sustainability, and the corporate social responsibility of MFIs. The following passage discusses the material and data used in the analysis and the empirical findings generated in the study. Furthermore, results of previous reviews, limitations, and implications thereof are also discussed.

THEORY AND HYPOTHESES DEVELOPMENT

This study looks at the modern finance theory, i.e., efficient market hypothesis, signaling theory, reputation theory, and stakeholder theory to develop hypotheses. Stakeholder theory focuses not only on the interests of stockholders but also fulfills the CSR toward stakeholders, both internally and externally (Woller, 2007; Sayekti, 2015; Rhou et al., 2016; Freeman and Dmytriyev, 2017). Signaling theory posits signals to the company's interested users (Watts and Zimmerman, 1978; Godfrey et al., 2009). Thus, Watts and Zimmerman (1978) signaling theory urges one to follow full disclosure assumptions so that stakeholders have complete information about the enterprise. Modern finance theory, i.e., efficient market hypothesis (EMH), reflects that all information about the assets is readily available to the investors and is reflected in the share price (Malkiel, 2003, 2005; Fama and French, 2004). Therefore, the financial performance of the company will send the signal to investors for their future decisions.

Financial Sustainability

Microfinance institutions can cover all expenses, operational costs, financial costs, and service expenses to enhance equity market value and to achieve their social goals (Thomas and Jyothi, 2016). MFIs charge a high-interest rate to attain financial sustainability, which is often criticized by the customers and policymakers in developing countries like Pakistan, India, and Bangladesh (Thomas and Jyothi, 2016). Return measures financial performance on Assets (Sweeney, 2009), which is the core goal of all stakeholders. Most prior studies (Cochran and Wood, 1984; Tucker, 2001; Hartarska and Nadolnyak, 2007; Sweeney, 2009; Gibson, 2012; Thomas and Jyothi, 2016) look at the return on equity (ROE), return on assets (ROA), return on sales, and earnings per share (EPS). These studies also find a positive association between CSR and financial performance. Financial sustainability is measured through two approaches; accounting returns and investor returns (Cochran and Wood, 1984; Lin et al., 2015).

Investor Returns

Prospective investors always want to know about returns on their investment. Investor return was employed in the studies of Moskowitz (1972) to measure the enterprise's financial performance and was then later used in many other studies (Cochran and Wood, 1984; Naz et al., 2019). Price per share was used as an investor return in Moskowitz (1972) studies, which was later found to be faulty. The dividend yield is also used to measure investor returns (Moskowitz, 1972; Cochran and Wood, 1984). These two measures of investor returns disregard the element of risk.

The finance theory or capital asset pricing model measures the risk and returns of holding assets (Cochran and Wood, 1984; Fama and French, 2004). The concept of "beta" is introduced, which is the slope of regression. The average coefficient is one, and if the stock beta is below 1, the stock is considered defensive, while if stock beta is over 1, it is considered aggressive (Cochran

and Wood, 1984; Fama and French, 2004). Later, modern finance theory, the efficient market hypothesis, was generated, affecting future cash inflows and share prices (Fama, 1991; Fama and French, 2004; Hussain et al., 2020a,b).

Accounting Returns

Accounting returns remain the other measures for financial performance (Cochran and Wood, 1984). The advantage of using accounting returns is to see the enterprise's implementation of reporting standards and managerial policies. Accounting returns are based on historical data, which leads to inflation that is the drawback of these measures (Cochran and Wood, 1984). Three accounting returns are employed in the studies of Cochran and Wood (1984); (1) the ratio of EBIT to assets, (2) the ratio of EBIT to sales, and (3) excess market value. Cochran and Wood (1984) study discussed the specific weakness of financial leverage differences as firms are selected from different industries. The said issue does not arise in the present study as we have collected primary data from the managers of the MFIs.

Prior studies used earnings per share (ESP), return on equity (ROE), and return on assets (ROA) as a proxy for financial performance in accounting measures (Tsoutsoura, 2004; Wafula et al., 2017; Cho et al., 2019). The current study also employs ESP, ROE, and ROA as an accounting measure to test financial performance. Still, the information is gathered through a questionnaire from the managers of MFIs banks.

Corporate Social Responsibility

Corporate social responsibility is the society's expectation from organization operating in their locality (Baldo, 2014; Sayekti, 2015; Galdeano et al., 2019). CSR is part of business ethics, and business ethics must be followed in corporate sectors (Christensen et al., 2007). Furthermore, the World Bank described that "companies with social responsibilities always think about their impact on environment, communities, and stakeholder goals to achieve profit." Companies with CSR responsibilities have to think about customers, employees, the environment, and its reputation, which is known as win-win strategies (Sayekti, 2015; Tuan, 2016). Nicolopoulou (2011) highlights the prominence of knowledge transfer toward CSR literature which helps in understanding the concept better.

CSR has a positive impact on sales, share price, and profit, leading to financial performance (Yang and Suvd, 2017). Jaakson et al. (2009), Loew et al. (2004), and Galdeano et al. (2019) defined CSR as "a concept whereby companies integrate social and environmental concerns in their business operations and their interaction with their stakeholders" voluntarily. CSR includes social responsibilities like legal, economical, and ethical activities (Cho et al., 2019) and a firm's contribution toward society, but these are not followed adequately in developing countries (Ofori and Hinson, 2007).

CSR's role as a moderating variable is tested in the studies of Tuan (2016) on organizational ambidexterity-entrepreneurial orientation relationships. CSR has positively moderated the relationship between both variables. CSR activities are not performed in all industries that never served CSR activities, but claimed regular exercises as CSR activities (Cherapanukorn and Focken, 2014). Furthermore, SMEs and family firms cannot correctly implement social and environmental practices (Murillo and Lozano, 2006; Marques et al., 2014).

Social performance in the microfinance industry is the outreach of microfinance to low income customers which is the objective of microfinance institutions (Woller, 2007; Thomas and Jyothi, 2016). The activities covered under social performance in MFIs include targeting customers and assessing the customers' needs (Thomas and Jyothi, 2016). In the current study, social responsibility involves customer retention, employees' trust in their MFIs to perform in terms of social objectives, social acceptance, and social capital building (Sweeney, 2009). These objectives of social performance will increase the future sustainability of the enterprise. CSR is mostly applied in enterprises but is not tested in MFIs.

Customers Retention

Corporate social responsibility contributed positively toward the enterprise image and developed the customers' trust in the firms that had enhanced the organization's financial performance (Galdeano et al., 2019). Customer retention is a benefit of CSR activity in an organization, which eventually contributes to sales and profit (Lee and Heo, 2009; Lee and Shin, 2010). On the other hand, customers argue that firms actively involved in CSR activities are trusted and produce higher quality products (McWilliams and Siegel, 2000). Prior studies claim a positive impact of CSR on sustainability and that it also increases customer retention (Berman et al., 1999; Brammer and Pavalin, 2006; Brammer et al., 2007; Carmeli et al., 2007).

Consumers are more interested in the firm's CSR activities than traditional factors like product price, quality, intrinsic value, and the financial performance of the firm (Brammer and Millington, 2008; Sweeney, 2009; Jose et al., 2012). The evidence of consumers' interest in CSR can be reviewed in many prior studies ranging from theories, blogs, magazines, books, and publications like "Shopping for a Better World." Sometimes, customers even care more about CSR activities than product quality and price (Sweeney, 2009). Prior studies mainly focus on customer retention as a formative construct of CSR in manufacturing firms but it is mostly ignored in the microfinance sector. Therefore, this gap is filled in the present study.

Employees Attraction and Loyalty

Corporate social responsibility also motivates internal employees (Skudiene and Auruskeviciene, 2012) to increase their commitment toward their work and firm (Brammer et al., 2007; Collier and Esterban, 2007). Employee engagement increases in firms where CSR activities are performed, and these activities impact the businesses in various positive ways (Hurst and Ihlen, 2018). Employees' loyalty develops toward multiple benefits like higher performance, improved customer service, and attracts new employees (Galdeano et al., 2019). It means that employees with higher loyalty and engagement put forward their best efforts to increase the financial performance of the organization (Brammer and Pavalin, 2006; Brammer et al., 2007; Brammer and Millington, 2008).

A potential applicant for a job prefers to apply to firms that are engaged in CSR activities. Furthermore, firms with CSR attract more applicants to open positions (Sweeney, 2009). The findings are furthered confirmed, in that potential employees pay closer attention to the firms' contribution to environmental issues, community projects, and diversity issues (Sweeney, 2009). Employee loyalty and attraction are considered in all manufacturing firms but is not used in the microfinance sector.

Enterprise Reputation

Enterprise reputation is an intangible asset and often deals with goodwill (Davies and Miles, 1998). Goodwill is sold and narrated in financial statements at different values using International Accounting Standards (IASs). This reputation affects the share value in the long-run and satisfies stakeholders' satisfaction with the firm's policies (Siano et al., 2010; Baldarelli and Gigli, 2014). Stakeholder theory and reputation theory are the drivers of corporate social responsibilities. The relationships of enterprise reputation and corporate social responsibilities in practice have already been tested in many prior studies and contribute to the literature. Reputation is an intricate marvel but is the primary formative variable of CSR (Janney and Gove, 2011).

CSR develops the enterprise's reputational capital, which increases public trust (Tang et al., 2012) and market value, indicating financial performance (Jiang and Yang, 2015; Yang and Suvd, 2017). CSR contributes to reputation theory and, in return, enhances corporate financial performance (Wang and Shenghua, 2016). Prior studies focused on the nature of the relationship between CSR and CFP in firms that had outperformed the market (Moskowitz, 1972, 1975; Galdeano et al., 2019). Likewise, CSR activities increase the enterprise's financial performance, which increases the enterprise itself (Brammer and Pavalin, 2006; Brammer et al., 2007; Brammer and Millington, 2008; Iamandi, 2012). Reputation was tested as a mediating variable in the studies of Sweeney (2009) between CSR-FP.

The resource-based view generates a competitive advantage and signals to shareholders and investors who want to make future contracts with the firm (Sweeney, 2009). Prior studies (Brammer and Pavalin, 2006; Sweeney, 2009; Siano et al., 2010) found a positive association between enterprise reputation and financial performance. Therefore, a firm's good reputation enhances share market values, and people trust the firm's information, whereas a lousy reputation reduces the market value of products and services. Therefore, the authors wanted to see the importance of MFIs' contribution in CSR activities.

Social Capital Availability

Under the resource-based view, the CSR-CFP link enhances the social capital for firms engaged in social and environmental activities (Brammer and Pavalin, 2006; Brammer et al., 2007; Brammer and Millington, 2008). More resources are allocated for CSR activities by some corporate companies. Some companies resisted the concept of additional investment in society for the environment and other activities as it reduces its profit (McWilliams and Siegel, 2000). Firms performing CSR activities have a greater chance of accessing social capital. Potential investors choose to invest in firms with adequate CSR (Baron, 2008). Sweeney (2009) also mentioned in his studies that creditors like credit unions, banks, and MFIs lean more toward firms with social responsibilities. Therefore, the authors wanted to test social capital available for firms with more CSR activities.

Corporate Social Responsibility and Financial Performance

Corporate social responsibility and financial performance have been reviewed in many prior studies in both developed and developing economies, and mixed results have been found, therefore, a meta-analysis was conducted and is discussed in the following subheadings.

Developed Economies

Cochran and Wood (1984) provided evidence of a weak positive correlation among CSR and FS in 39 firms registered in America. Yang and Suvd (2017) analyzed CSR's impact on the financial performance of 16 low-cost airlines. CSR increases the financial performance of carriers. Wang and Shenghua (2016) reviewed CSR and CFP links in the meta-analytic framework in 42 studies. The relationship was found to be positive and significant and supported the stakeholder theory. CSR and CFP also support the market efficiency hypothesis. The association of CSR and financial performance is more notable for developed countries than in developing countries; however, it was found to be neutral in McWilliams and Siegel (2000) study.

Rhou et al. (2016) researched CSR awareness as a mediating variable on CSR and FP's association in 5,812 restaurants in Northern America from CPI. The results indicate that CSR awareness affects the initiatives of the managers for CSR and financial performance. The data for 500 companies registered in the American stock exchange from 1998 to 2008 were collected for the analysis of CSR and intellectual capital and financial performance was collected from the Compustat database (Lin et al., 2015). The results indicate a direct impact of CSR on FP through the mediating effect of intellectual capital. Tsoutsoura (2004) demonstrated a positive and significant impact of social responsibilities on financial performance in S&P 500 firms in Northern America.

The broader Canadian firms were motivated to issue separate CSR reports as they faced political and societal pressures. In contrast, small firms were found to be less-interested in the publication of information (Thorne et al., 2014). It generates concerns that even in developed countries, small firms hesitate to take part in CSR activities. Tang et al. (2012) collected longitudinal data from 130 firms of the S&P 500 from 1995 to 2007 to establish the CSR-CFP relationship in the presence of an engagement strategy. The results could not, however, establish the relationship of CSR-CFP.

Stubbs and Schapper (2011) worked on sustainability and CSR in the educational institutes of Australia. The authors' used a case study on two subjects of corporate sustainability. CSR and sustainability have a positive relationship. Australian SMEs were researched in Torugsa et al. (2012), where the authors empirically tested the association of proactive CSR and FP. The study results are consistent with the BRV theory and found its capabilities to improve financial performance. Sweeney (2009)

used the structural equational model in SMEs and larger firms to determine CSR and FP's positive association and obtained results consistent with prior studies.

Emerging Markets and Developing Economies

Fauzi and Idris (2009) researched the association of CSR and corporate financial performance, of the good management theory and the slack resource theory of firms in Indonesia. The findings showed that CSR positively impacted the financial performance of companies. Sayekti (2015) studied Indonesia Stock Exchange companies for 4 years to determine the relationship between strategic CSR and non-strategic CSR and financial performance. The empirical findings showed a positive effect of strategic CSR on financial performance, whereas non-strategic CSR was negatively associated with FP.

The relationship between social performance and financial sustainability of MFIs in India was assessed by Thomas and Jyothi (2016). The financial sustainability of MFIs is different from conventional banks and are measured differently as it includes the balance between social and financial performance. Akben Selcuk and Kiymaz (2017) found a relationship between firm performance and CSR in firms listed in Borsa Istanbul and used the content analysis to obtain data from financial statements. The results showed a negative association among the variables.

A study was conducted by Cho et al. (2019) on 191 firms listed at the Korea stock exchange to measure CSR performance and financial performance (profitability, firm value). Profitability was measured through return on assets. The empirical evidence found a positive relationship between CSR performance and profitability and firm value. The association was also tested in the studies of Platonova et al. (2018), where the authors found a significant positive association of CSR disclosure and financial performance in the Islamic banks of GCC over 15 years.

Another study was conducted by Ofori and Hinson (2007) in Ghana to gain insight on CSR's perspective in 100 leading firms. The prior study was further extended in Kuada and Hinson (2012) studies in Ghana, where local firms adopt CSR policies according to society's local culture. Galdeano et al. (2019) predicted future financial performance through CSR and the moderator role of organizational engagement in Bahrain's banking industry. The findings showed a positive relationship of CSR on the FP and reported a significant impact of organizational engagement on the CSR-FP relationship. Doh et al. (2015) focused on the emergence of CSR and sustainability in Brazil's emerging markets. The authors worked on the impact of societal, institutional, and organizational (CSR activities) on society.

Using the extensive literature on the CSR and FP in both developed and developing countries, CSR was applied to the Aviation industry, Higher Education, Restaurant Industry, SMEs, Islamic banks, and manufacturing firms. The CSR and Financial performance were not tested in the microfinance sector of Pakistan. The following hypothesis was generated for testing.

Hypothesis 1: Corporate Social Responsibility is positively attached to Financial Sustainability.

Esampally and Joshi (2016) identified five OSS determinants in India's MFIs and non-banking financial companies. These include yield on GLP, total assets, cost per borrower, GLP, and several active borrowers. The findings showed that the increase of OSS could be obtained through a rise in total assets and yield on GLP, while OSS will decrease with cost per borrower and active borrowers in MFIs. Strategies were developed for CSR and sustainability in developing countries' multinational enterprises (DCMNES). CSR directly improves the OSS of the companies and enhances the firm's value (Doh et al., 2015). The following hypothesis can therefore be generated.

Hypothesis 2: Corporate Social Responsibility is positively associated with Operational Self-Sustainability in the microfinance sector of Pakistan.

Operational Self-Sustainability

The operational cost of MFIs is higher than other banks as these provide services to the unbanked at their doorstep (Naz et al., 2019). The MFIs have to perform this function to raise low-income customers' income levels (Akram and Hussain, 2011). Therefore, measurement of OSS (revenues minus operational expenses) is a better approach than FSS (Rai et al., 2010; Schäfer and Fukasawa, 2011; Rai and Rai, 2012). Operational self-sufficiency is expressed in percentage and shows whether MFI covers operating cost, financial cost, and loan losses, and is achieved if it is more than 100 percent (Esampally and Joshi, 2016). OSS can be found by reducing cost or increasing revenues (Adongo and Stork, 2006; Schäfer and Fukasawa, 2011; Beg, 2016).

The financial sustainability in MFIs can be obtained through the gaining of operational self-sufficiency in the long term, which reduces cost and increases efficiency (Adongo and Stork, 2006; Balkenhol, 2007; Rai et al., 2010; Rai and Rai, 2012; Hamad and Duman, 2013; Velnamby and Alagathurai, 2014; Balagobei, 2016; Beg, 2016; Esampally and Joshi, 2016; Lensink et al., 2018). Khan and Sulaiman (2015) reported the inefficiency of MFIs in operating cost and loan officers and optimal use of financial assets. It means that an MFI is financially sustainable if it is operationally self-sustained. The following hypothesis can therefore be generated.

Hypothesis 3: Operational Self-Sustainability is positively associated with financial sustainability.

Corporate Social Responsibility was directly tested with Financial performance in many prior studies (Adongo and Stork, 2006; Balkenhol, 2007; Rai et al., 2010; Rai and Rai, 2012; Hamad and Duman, 2013; Velnamby and Alagathurai, 2014; Balagobei, 2016; Beg, 2016; Esampally and Joshi, 2016; Lensink et al., 2018) but operational self-sustainability is the critical variable in the Microfinance sector. OSS's role cannot be ignored as the literature depicts that an MFI is financially viable if its operational cost is less than its operating income, whereas, CSR increases the operational expenses and decreases the profitability of the firm. The study therefore tests the following hypothesis.

Hypothesis 4: Operational Self-Sustainability mediates the relationship of CSR and Financial Sustainability in MFIs operating in Pakistan.

Figure 1 depicts the theoretical framework, explaining corporate social responsibility as an independent variable, operational self-sustainability as a mediator, and financial sustainability as a dependent variable.

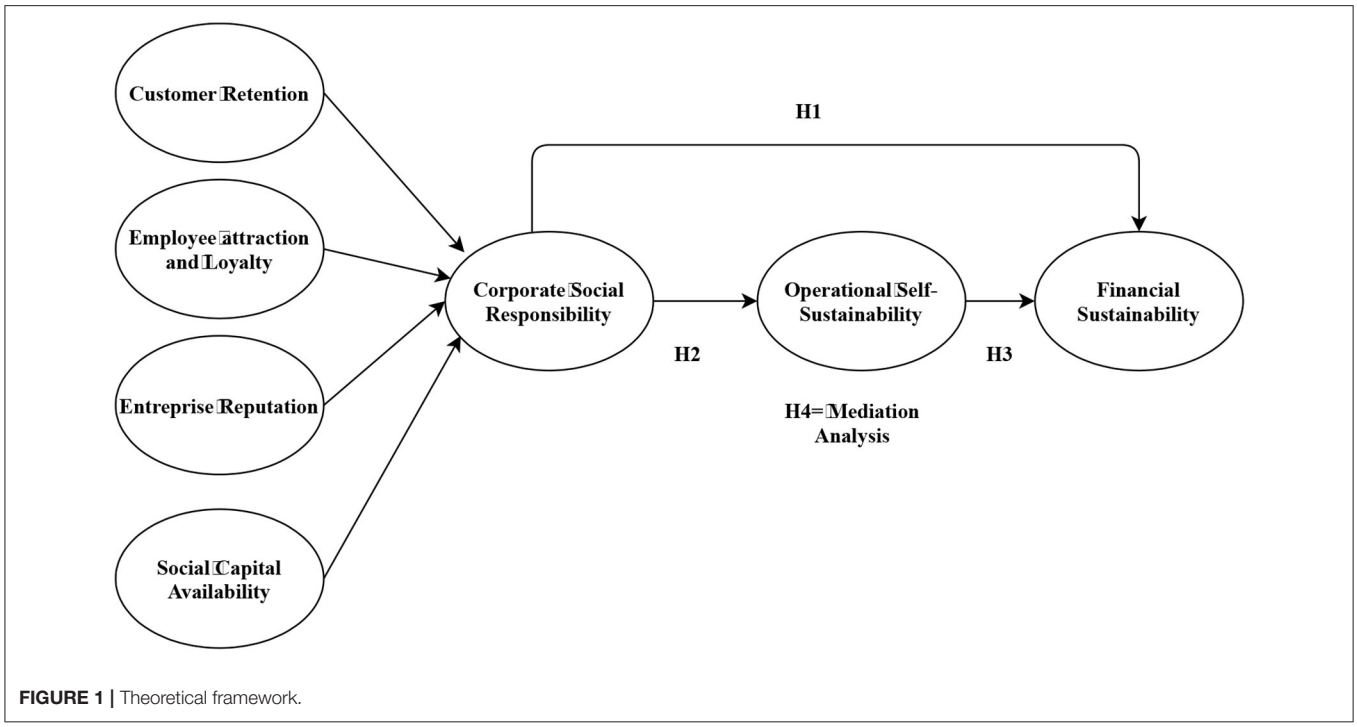

FIGURE 1 | Theoretical framework.

MATERIALS AND METHODS

Data Collection and Analysis

Pilot testing was conducted with 30 Territory and Area Managers to validate the adaptation of the questionnaire of Sweeney (2009) along with rigorous testing before final the self-administration (Saunders et al., 2019). In the pilot testing, the acceptable response rate was achieved as the researcher personal visited the respondents' offices. Questions that were not adequately understood by mid-level managers, were modified again.

A common method, the survey method, was used to collect the data from the 1,400 branch managers of large MFIs operating in Pakistan. Seven hundred questionnaires were posted and emailed to managers in Sindh, Khyber Pakhtunkhwa and Balochistan, Gilgit Baltistan, and Azad Jammu Kashmir. In contrast, data from Punjab and Islamabad were personally collected. A judgmental sampling technique was used to collect data from managers of MFIs. The response rate for posted and emailed questionnaires was 31%, whereas personally administrated questionnaires obtained a response rate of over 69%. A total of 422 completed questionnaires were collected. Only 372 questionnaires were useable. The demographic information of the respondents is provided below in **Table 1.**

TABLE 1 | Demographic information of respondents.

Variables	Categories	Frequency	Percentage
Gender	Male	233	62.6
	Female	139	37.4
Marital status	Single	194	52.15
	Married	178	47.85
Age	≤20	30	8.06
	21–25	166	44.6
	26–30	140	37.6
	≥31	36	9.74

Measures of Variables

In prior studies, CSR has generally been measured in two ways (Cochran and Wood, 1984) (**Table 2**). First, it is calculated based on some indicators determined by experts in the relevant field of CSR. The second method has already been used in the studies of Moskowitz (1972, 1975), where the reputation index was developed with a ranking scale of "outstanding," "honorable," and "worst." Both of these measures are more subjective. Therefore, other dimensions of CSR are used in this study which can easily measure the variable, i.e., customer retention (CR), employee attraction and loyalty (EL), enterprise reputation (ER), and access to capital (SC) (Cochran and Wood, 1984; Sweeney, 2009; Jose et al., 2012; Tang et al., 2012; Torugsa et al., 2012). A five-point Likert scale was used to measure these variables.

Compared to CSR, financial performance is challenging to measure as researchers have not reached a consensus on a measurement method. However, financial performance is measured through investors' returns and accounting returns (Cochran and Wood, 1984; Sweeney, 2009; Torugsa et al., 2012).

RESULTS

The data was collected through a questionnaire, and is known as primary data. To analyze the primary data gathered in the collection process, Smart PLS 3.0 is applied. This software

TABLE 2 | Measurement of variables.

Variable	Description	References
Corporate social responsibility	CSR covers the social responsiveness performed by MFIs in the society, i.e., Customers Retention, Employees Attraction and Loyalty, Enterprise Reputation and Social capital access	Cochran and Wood, 1984; Marrewijk, 2003; Sweeney, 2009; Jose et al., 2012; Tang et al., 2012
Operational self-sustainability	Operational self-sufficiency is obtained if the cost of advancement is less than the revenue generated from lending/loans	Sweeney, 2009; Vanroose and D'Espallier, 2013; Daher and Saout, 2015; Doh et al., 2015; Naz et al., 2019
Financial sustainability/performance	Financial sustainability is calculated through Earnings per share, dividend yield, Return on Assets, Return on Investment, Net profit to sales, the stock price	Cochran and Wood, 1984; Sweeney, 2009; Tang et al., 2012; Torugsa et al., 2012; Sayekti, 2015; Thomas and Jyothi, 2016; Meyer, 2019

has many advantages over others. Formative constructs can be interpreted as possible with the help of Smart PLS, whereas covariance-based software like AMOS cannot handle this. The present study applied PLS-SEM to analyze and validate the relationship between the defined variables in the model.

Measurement Model

As shown in **Table 3**, SmartPLS tests the reliability and provides the values for Cronbach's alpha and composite reliability (CR) of all defined variables in the model. The values that are >0.70 are acceptable; thus, all values of the variables meet the requirements of CR cut off (Marakas et al., 2007). Both Cronbach's alpha and CR are used to calculate the reliability of the questionnaire. The Average Variance Extracted (AVE) is estimated to determine convergent validity. The convergent validity threshold criterion is that the AVE should be higher than 0.50, for all the build (Hair et al., 2016). The values suggested that these variables satisfy those requirements.

The present study applied the well-known criteria (Fornell and Larcker, 1981). It describes that AVE's square root should be greater than its correlation with any other latent variables in a model. **Table 4** explains that AVE's square roots are greater than the correlation of other latent variables, which confirmed the condition of discriminant validity.

HTMT correlation ratio is also determined and was based and proposed by Henseler et al. (2015). It is a new instrument used for assessing discrimination's legitimacy. HTMT 's maximum appropriate value for verifying discriminant validity is 0.85, whereas any value above suggests a validity issue (Henseler et al., 2015). The findings of the HTMT are provided in **Table 5**.

Formative Constructs

The present study applied the latest convictions (Hajli, 2014; Gaskin et al., 2018). Corporate social responsibility (CSR) is used as a multidimensional construct in this research, so it is essential to validate its four dimensions. After applying the guidelines suggested by Gaskin et al. (2018). The results proved that the four dimensions (Social capital, reputation, EL, and CR) are traits of corporate social responsibility and are shown in **Table 6**. These figures demonstrated that CSR could work as a higher-operative construct in this study.

Common Method Biased Variance

Data were obtained from a single source and is cross-sectional, so Harman's single-factor test was used to verify the common system variance (CMV). Since a popular method was used in data collection, spurious covariance shared among variables was tested (Podsakoff et al., 2003). An exploratory factor analysis of all the build products' items showed that the first two factors cumulatively account for 39.92% of the variance, with the first factor accounting for 33.52% and the second factor explaining 6.39% of the overall variance. The single factor did not account for any variance, which means the data was not influenced.

Structural Model

The scores are calculated from Smart PLS which appear in **Table 7** and **Figure 2**. As the results show, each relationship is significant and noteworthy at the 0.05 level. The model's validity is determined by R square estimation (Hair et al., 2010). R square has shown that 30.12% of the change in financial sustainability occurred due to operational self-sustainability and a 35.09% change in operational self-sustainability due to corporate social responsibility. For specific endogenous latent constructs, the Q^2 values measured must be >0 in the SEM. It demonstrates that the Q^2 values were equal to 0.401 and 0.311 for this study model, respectively, which was higher than the threshold limit, and supports the predictive relevance of the path model for the endogenous construct. The present study is deductive because it is used to clarify the relationships made in the model. The structural equation modeling technique was applied through bootstrapping and implemented to get the results of t-statistics. The bootstrapping of 5,000 resamples and 372 cases explained that corporate social responsibility significantly impacted operational self-sustainability, proving H1. Operational self-sustainability also has a significant and positive effect on financial sustainability ($T = 5.59$, $p < 0.05$). Furthermore, the present study has also validated the results of H3, proving that corporate social responsibility has a positive impact on financial sustainability ($T = 3.90$, $p < 0.05$). **Table 7** and **Figure 2** explains the results of the hypotheses explained in the research model.

Mediation Analysis

To test for the mediating role through H4, the present study engaged the latest conventions (MacKinnon et al.,

TABLE 3 | Reliability analysis.

Variables	Cronbach's alpha	Rho_A	Composite reliability	Average variance extracted (AVE)
CR	0.935	0.936	0.949	0.756
EL	0.898	0.899	0.929	0.667
FS	0.891	0.904	0.924	0.753
OSS	0.931	0.945	0.948	0.785
Reputation	0.932	0.933	0.947	0.748
Social capital	0.918	0.921	0.939	0.754

TABLE 4 | Discriminant validity.

Variables	CR	EL	FSS	OSS	Reputation	Social capital
CR	0.870					
EL	0.417	0.876				
FS	0.480	0.480	0.868			
OSS	0.523	0.510	0.457	0.886		
Reputation	0.600	0.524	0.501	0.527	0.865	
Social capital	0.541	0.438	0.528	0.513	0.624	0.868

**Significant at 0.05.*

TABLE 5 | HTMT.

	CR	EL	FS	OSS	Reputation	Social capital
CR						
EL	0.616					
FS	0.326	0.421				
OSS	0.601	0.541	0.326			
Reputation	0.643	0.404	0.121	0.683		
Social capital	0.601	0.512	0.431	0.579	0.389	

2002; Hayes, 2013), focused on bootstrapping. For the mediating effect, the indirect effect must also be significant (Hussain et al., 2020). Operational self-stability means working as a mediator, mediating corporate social responsibility and financial sustainability. The present study analyzed and discovered that corporate social responsibility has a significant and positive relationship with financial sustainability. Furthermore, the indirect effects of the hypothesis were also substantial. **Table 8** describes mediation results, and this hypothesis is partially mediated. It further shows that Variance accounted for (VAF=indirect effect/Total effect) 22.53% of operational self-sustainability.

DISCUSSION AND CONCLUSION

The study employed SmartPLS to test the direct association between CSR and financial performance, and the formative construct of CSR activities: customer retention, employees' attraction and loyalty, social capital, and enterprise reputation. Furthermore, the mediating effect of operational self-sufficiency on the CSR and financial performance relationship was also tested.

TABLE 6 | Validating formative constructs.

Relationship	Type	Original mean	Standard deviation	T statistic	*P*-value
CR → CSR	1st → 2nd	0.294	0.007	39.944	0.000
EL → CSR	1st → 2nd	0.200	0.006	34.475	0.000
Reputation → CSR	1st → 2nd	0.293	0.008	35.037	0.000
Social capital → CSR	1st → 2nd	0.244	0.008	31.171	0.000

TABLE 7 | Hypothesis results.

Relationship	Original mean	Standard deviation	T statistic	*P*-value	Hypothesis supported?
CSR → OSS	0.536	0.074	7.265	0.000	Yes
CSR → FS	0.245	0.063	3.905	0.001	Yes
OSS → FS	0.457	0.082	5.597	0.002	Yes

The formative construct of CSR activities, CR, EL, Reputation, and social capital, were significant positive contributors toward CSR. Customer retention was deemed a vital benefit of CSR and ultimately increased sales and profitability. Customers were more interested in CSR activities in the prior studies (Berman et al., 1999; Brammer and Pavalin, 2006; Brammer and Millington, 2008). The findings were also consistent with Sweeney (2009) investigations in Ireland and Cochran and Wood (1984) in America, where weak positive association was found. Employee loyalty is another benefit of CSR that positively impacts its financial efficiency (Brammer et al., 2007; Collier and Esterban, 2007; Brammer and Millington, 2008; Sweeney, 2009). This study's results are consistent with prior reviews and found a positive association between employee loyalty and CSR.

Enterprise reputation is another dimension of CSR and found a positive association between reputation and CSR in prior studies (Brammer and Pavalin, 2006; Sweeney, 2009; Iamandi, 2012; Tang et al., 2012; Wang and Shenghua, 2016). The current study results indicate a positive contribution of a firm's reputation in CSR activities, consistent with prior studies. Social capital is more readily available for those firms which are engaged in CSR activities. People trust CSR-based firms and invest in those (McWilliams and Siegel, 2000; Brammer and Pavalin, 2006; Baron, 2008; Sweeney, 2009). Social capital was significantly positively correlated to CSR—consistent with the prior studies.

The prior literature review highlighted the issue of non-consensus on the definition of corporate social responsibility (Cochran and Wood, 1984; Christensen et al., 2007; Sweeney, 2009; Lee and Shin, 2010; Marques et al., 2014; Rhou et al., 2016; Naz et al., 2019). Each author presumes a different concept of CSR activities, and this was the first objective of this study—to see whether MFIs understand the CSR term in Pakistan. The common definition through the stakeholder theory was developed by narrating customers, community, environment, and employees. During the study, it was found that large MFIs were more familiar with the concept of CSR than small/new MFIs (Sweeney, 2009).

CSR is the topic of great importance in Pakistani culture (Khan and Sulaiman, 2015; Khan et al., 2017; Naz et al., 2019) and

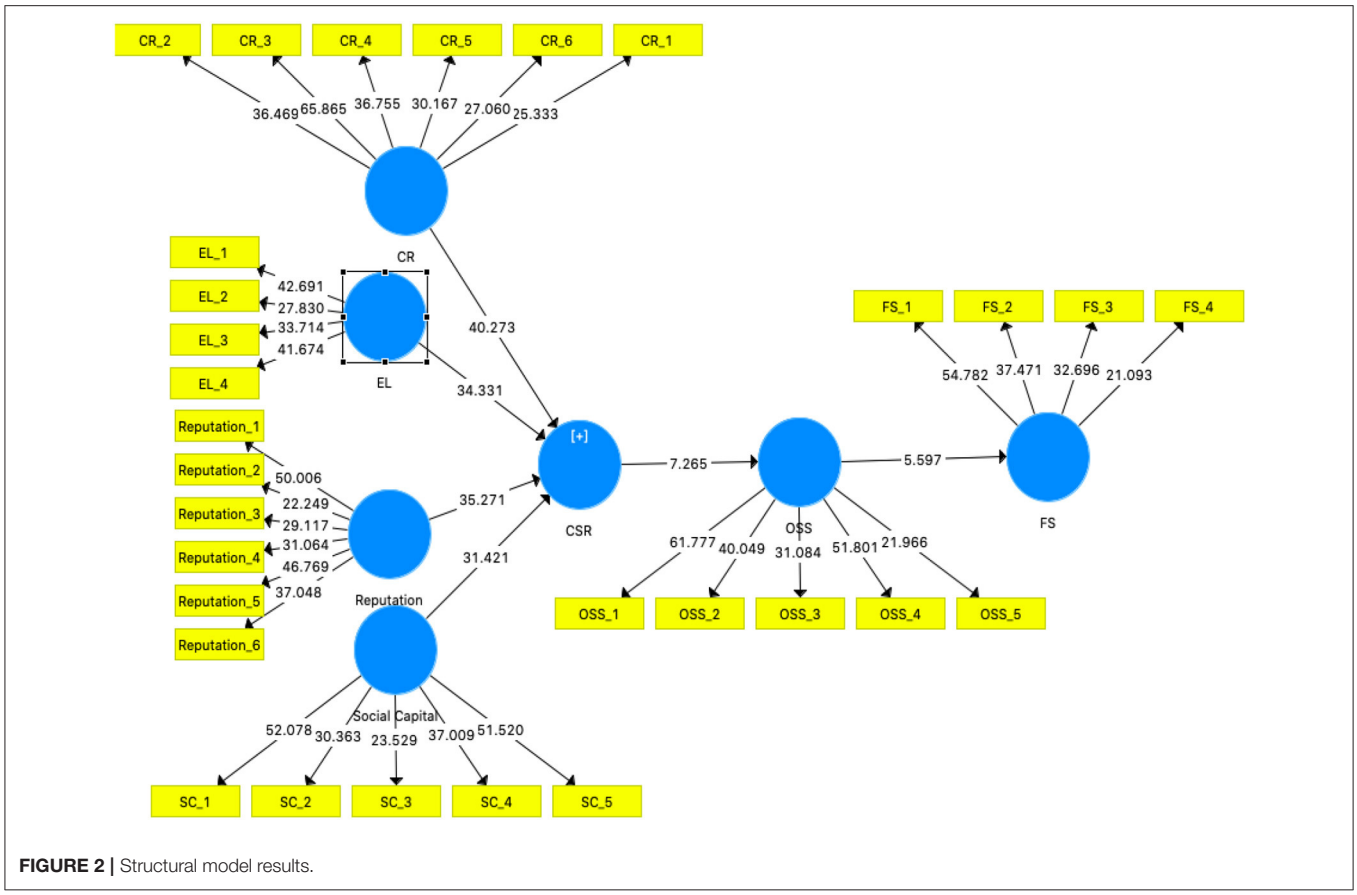

FIGURE 2 | Structural model results.

TABLE 8 | Mediation analysis.

Relationship	Direct effect	Indirect effect	Total effect	VAF	Type of mediation
CSR → FS	0.251				
CSR → OSS → FS		0.251*0.288 = 0.073	0.324	22.53%	Partial

South Asian countries (Cassar and Wydick, 2010; Jose et al., 2012; Sim and Prabhu, 2014; Thomas and Jyothi, 2016). The results also proved that CSR activities are an essential topic for Pakistani society, consistent with prior studies.

Hypothesis 1 shows the association of CSR and financial self-sufficiency, which are studied in many prior studies both in developed and emerging economies. The results generated were contradictory, and researchers did not reach a consensus on the relationship. CSR had a weak positive correlation with financial performance in the studies of Cochran and Wood (1984), whereas a strong positive association was found in the studies of Tsoutsoura (2004), Thorne et al. (2014), Lin et al. (2015), Rhou et al. (2016), Wang and Shenghua (2016), and Yang and Suvd (2017). Sweeney (2009) also found a positive association between CSR and FP in SMEs of Ireland. Financial sustainability and social responsibilities were also tested in MFIs of India, Pakistan, Nigeria, and Bangladesh, and a positive relationship was found in prior studies.

Hypothesis 2 shows the association of Corporate Social Responsibility with Operational Self-Sustainability in the microfinance sector of Pakistan. CSR increases operational costs, on the one hand, and the other, enhances the companies' financial performance. The results of the prior studies depict a positive connotation between CSR and FP. The findings of the current study are consistent with previous studies. Hypothesis 3 illustrates the relationship between OSS and Financial sufficiency in the Microfinance sector of Pakistan. OSS was strongly positively associated with Financial sustainability in many prior studies both in developed and developing economies (Adongo and Stork, 2006; Rai et al., 2010; Schäfer and Fukasawa, 2011; Rai and Rai, 2012; Beg, 2016; Esampally and Joshi, 2016; Naz et al., 2019). The current study results are consistent with prior studies except for Cochran and Wood (1984), where a weak correlation was found between CSR-FP. It means that if the firm is operationally sustainable, it is financially self-sufficient. The current study also found a positive correlation between CSR and financial performance—consistent with prior studies.

Hypothesis 4 shows that Operational Self-Sustainability mediates the relationship of CSR and Financial Sustainability in MFIs operating in Pakistan. The results of the study show the partial mediation of OSS on the relationship between CSR and FS. Operational self-sufficiency was not tested as a mediator in prior studies but results depicted the importance of OSS in the model.

Theoretical Contributions

Stakeholder theory rests on the concept of protection to all firms' stakeholders, not only to shareholders. Stakeholder theory suggests the importance of employees, customers, and society. However, the stakeholder theory has not tested in the MFIs of Pakistan before. MFIs have to trade-off between CSR and financial sustainability; therefore, this study will contribute to existing literature to balance stakeholders' interests (Marrewijk, 2003). The current research will also contribute to signaling theory that will provide signals to stakeholders for making a potential investment (Watts and Zimmerman, 1978) in leading MFIs. Signaling theory is vital only when the financial market is efficient, representing full market information (Watts and Zimmerman, 1978; Fama, 1991).

Practical Implications

The practical implication of this research is that prior studies (Cochran and Wood, 1984; Brammer and Pavalin, 2006; Brammer et al., 2007; Ofori and Hinson, 2007; Brammer and Millington, 2008; Sweeney, 2009; Sim and Prabhu, 2014; Meyer, 2019) did not reach a consensus on the relationship of CSR and FP. Most of the prior studies found a positive association between CSR and FP, which was already being implemented in the firms. MFIs will do CSR activities, improving their operational sustainability, and ultimately leading to financial sustainability. This research tests the direct relationship between CSR and FP, and the impact of operational self-sufficiency as the mediating variable is included. The mediating role of OSS will further enhance the understanding of the CSR-FP relationship.

The results of the current study, consistent with prior studies, also mention that CSR activities would increase employees' commitment and engagement (Brammer et al., 2007; Sweeney, 2009), customer loyalty (Brammer and Millington, 2008; Lee and Heo, 2009; Sweeney, 2009), increase enterprise reputation (Brammer and Pavalin, 2006; Sweeney, 2009), and enhance accessible social capital (Sweeney, 2009). Therefore, managers are known to implement these CSR activities to obtain those benefits.

Limitations and Future Research Directions

The study was conducted in MFIs under immense pressure to gain self-sustainability and market value for further investment and outreach. Limited data was collected from managers of microfinance institutions only, which can cause issues for generalizability. Other studies should be conducted to compare CSR activities on financial performance (FP) in MFIs and conventional banks. A comparison of the findings generated from primary data through the questionnaire and secondary data (content analysis of financial statements) should be made to find the best method of conducting this type of study. Corporate governance also plays a vital role in implementing CSR activities and the improvement of financial performance. Hence, corporate governance should be used as a moderating variable to obtain the validity of results.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the ethics committee of the Department of Management Sciences, University of Okara, Pakistan. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

RH, SB, and SH conceived of the presented idea. RH developed the theory and SH performed the computations. SB verified the analytical methods. RH encouraged SH to investigate CSR and Operational self-sustainability and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.550029/full#supplementary-material

REFERENCES

Abdelkbir, E., and Faiçal, Z. (2015). Corporate social responsibility and financial performance. *Afr. J. Account. Audit. Finance* 4, 74–85. doi: 10.1504/AJAAF.2015.071749

Adongo, I., and Stork, C. (2006). *Factors Influencing the Financial Sustainability of Selected Microfinance Institutions in Namibia*. The Namibian Economic Policy Research Unit. Available online at: http://uir.unisa.ac.za/ (acceesed April 24, 2020).

Akben Selcuk, E., and Kiymaz, H. (2017). Corporate social responsibility and firm performance: evidence from an emerging market. *Account. Finance Res.* 6:42. doi: 10.5430/afr.v6n4p42

Akram, M., and Hussain, R. I. (2011). The role of microfinance in uplifting income level: a study of district Okara-Pakistan. *Interdiscip. J. Contemp. Res. Bus.* 2, 83–94.

Balagobei, S. (2016). Efficiency of micro finance institutions and financial sustainability in Jaffna district. *J. Econ. Sustain. Dev.* 7, 1–6.

Baldarelli, M. G., and Gigli, S. (2014). Exploring the drivers of corporate reputation integrated with a corporate responsibility perspective: some reflections in theory and in Praxis. *J. Manag. Gov.* 18, 589–613. doi: 10.1007/s10997-011-9192-3

Baldo, M. D. (2014). Corporate social responsibility, entrepreneurial values and transcendental virtues in Italian SMEs. *Int. J. Bus. Soc. Sci.* 5, 25–51.

Balkenhol, B. (2007). "Efficiency and sustainability in microfinance," in *Microfinance Public Policy,* ed B. Balkenhol (London: Palgrave Macmillan), 3–23. doi: 10.1057/9780230300026_1

Baron, D. (2008). Managerial contracting and corporate social responsibility. *J. Public Econ.* 92, 268–288. doi: 10.1016/j.jpubeco.2007.05.008

Beg, K. (2016). Determinants of financial self sufficiency of Andhra Pradesh microfinance institutions. *J. Bus. Financial Aff.* 5, 1–9. doi: 10.4172/2167-0234.1000209

Berman, S. L., Wicks, A. C., Kotha, S., and Jones, T. M. (1999). Does stakeholder orientation matter? The relationship between stakeholder management models and financial performance. *Acad. Manag. J.* 42, 488–506. doi: 10.5465/256972

Brammer, S., and Millington, A. (2008). Does it pay to be different? An analysis of the relationship between corporate social and financial performance. *Strateg. Manag. J.* 29, 1325–1343. doi: 10.1002/smj.714

Brammer, S., Millington, A., and Rayton, B. (2007). The contribution of corporate social responsibility to organizational commitment. *Int. J. Hum. Resour. Manag.* 18, 1701–1719. doi: 10.1080/09585190701570866

Brammer, S., and Pavalin, S. (2006). Corporate reputation and social performance: the importance of fit. *J. Manag. Stud.* 43, 435–455. doi: 10.1111/j.1467-6486.2006.00597.x

Carmeli, A., Gilat, G., and Waldman, D. A. (2007). The role of perceived organizational performance in organizational identification, adjustment and job performance. *J. Manag. Stud.* 44, 972–992. doi: 10.1111/j.1467-6486.2007.00691.x

Cassar, A., and Wydick, B. (2010). Does social capital matter? Evidence from a five-country group lending experiment. *Oxford Econ. Pap.* 62, 715–739. doi: 10.1093/oep/gpq010

Cherapanukorn, V., and Focken, K. (2014). Corporate social responsibility (CSR) and sustainability in asian luxury hotels: policies, practices and standards. *Asian Soc. Sci.* 10, 198–209. doi: 10.5539/ass.v10n8p198

Cho, S. J., Chung, C. Y., and Young, J. (2019). Study on the relationship between CSR and financial performance. *Sustainability,* 11, 1–26. doi: 10.3390/su11020343

Christensen, L. J., Peirce, E., Hartman, L. P., Hoffman, W. M., and Carrier, J. (2007). Ethics, CSR, and sustainability education in the financial times top 50 global business schools: baseline data and future research directions. *J. Bus. Ethics* 73, 347–368. doi: 10.1007/s10551-006-9211-5

Cochran, P. L., and Wood, R. A. (1984). Corporate social responsibility and financial performance. *Acad. Manag. J.* 27, 42–56. doi: 10.5465/255956

Collier, J., and Esterban, R. (2007). Corporate social responsibility and employee commitment. *Bus. Ethics* 16, 19–33. doi: 10.1111/j.1467-8608.2006.00466.x

Daher, L., and Saout, E. (2015). The determinants of the financial performance of microfinance institutions: impact of the global financial crisis. *Strateg. Change* 24, 131–148. doi: 10.1002/jsc.2002

Davies, G., and Miles, L. (1998). Reputation management: theory versus practice. *Corp. Reputation Rev.* 2, 16–27. doi: 10.1057/palgrave.crr.1540064

Doh, J. P., Littell, B., and Quigley, N. R. (2015). CSR and sustainability in emerging markets: societal, institutional, and organizational influences. *Organ. Dyn.* 44, 112–120. doi: 10.1016/j.orgdyn.2015.02.005

Esampally, C., and Joshi, M. K. (2016). Operational self-sufficiency of select NBFC-MFIS of Andhra Pradesh. *SMART J. Bus. Manag. Stud.* 12:1. doi: 10.5958/2321-2012.2016.00009.9

Fama, E. F. (1991). Efficient capital markets: II. *J. Finance* 46, 1575–1617. doi: 10.1111/j.1540-6261.1991.tb04636.x

Fama, E. F., and French, K. R. (2004). The capital asset pricing model: theory and evidence. *J. Econ. Perspect.* 18, 25–46. doi: 10.1257/0895330042162430

Fauzi, H., and Idris, K. M. (2009). The relationship of CSR and financial performance: new evidence from Indonesian companies. *Issues Soc. Environ. Account.* 3:66. doi: 10.22164/isea.v3i1.38

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Market. Res.* 18, 39–50. doi: 10.1177/002224378101800104

Freeman, R. E., and Dmytriyev, S. (2017). Corporate social responsibility and stakeholder theory: learning from each other. *Symphonya. Emerg. Issues Manag.* 1:7. doi: 10.4468/2017.1.02freeman.dmytriyev

Galdeano, D. M., Fati, M., Ahmed, U., Rehan, R., and Ahmed, A. (2019). Financial performance and corporate social responsibility in the banking sector of Bahrain: can engagement moderate? *Manag. Sci. Lett.* 9, 1529–1542. doi: 10.5267/j.msl.2019.5.032

Gaskin, J., Godfrey, S., and Vance, A. (2018). Successful System-use: it's not just who you are, but what you do. *AIS Trans. HCI.* 10, 1–33. doi: 10.17705/1thci.00104

Gibson, A. B. (2012). *Dterminants of Operational Sustainability of Microfinance Institutions in Kenya*. Nairobi: University of Nairobi.

Godfrey, P. C., Merrill, C. B., and Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis. *Strateg. Manag. J.* 30, 425–445. doi: 10.1002/smj.750

Hair, J., Black, W., Babin, B., and Anderson, R. (2010). *Multivariate Data Analysis, 7th Edn*. Upper Saddle River, NJ: Prentice-Hall, Inc.

Hair, J. F., Hult, G. T. M., Ringle, C., and Sarstedt, M. (2016). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Munich: Sage Publications. doi: 10.15358/9783800653614

Hajli, N. (2014). The role of social support on relationship quality and social commerce. *Technol. Forecast. Soc. Change* 87, 17–27. doi: 10.1016/j.techfore.2014.05.012

Hamad, M., and Duman, T. (2013). An Evaluation of micro-credit programs in Bosnia and Herzegovina using porter's diamond model. *Eurasian J. Bus. Econ.* 6, 27–42.

Hartarska, V., and Nadolnyak, D. (2007). Do regulated microfinance institutions achieve better sustainability and outreach? Cross-country evidence. *Appl. Econ.* 39, 1207–1222. doi: 10.1080/00036840500461840

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford Press.

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Market. Sci.* 43, 115–135. doi: 10.1007/s11747-014-0403-8

Hudon, M., and Traca, D. (2011). On the efficiency effects of subsidies in microfinance: an empirical inquiry. *World Dev.* 39, 966–973. doi: 10.1016/j.worlddev.2009.10.017

Hurst, B., and Ihlen, O. (2018). "Corporate social responsibility and engagement," in *Handbook of Communication Engagement*, eds K. A. Johnston, and M. Taylor (Wiley), 133–152. doi: 10.1002/9781119167600.ch10

Hussain, R. I., Abidin, N. S. Z., Ibrahim, F., and Joginder, J. S. (2020a). Accruals in the prediction of forthcoming cash flows in the companies listed at Pakistan stock exchange. *Int. J. Econ. Financial Issues* 10, 130–139. doi: 10.32479/ijefi.10313

Hussain, R. I., Saadah, N., Ibrahim, F., Joginder, J. S., and Hanzla, M. (2020b). Disaggregated accruals and prediction of future cash flows: an effect of global financial crisis 2008-09. *Int. Trans. J. Eng. Manag. Appl. Sci. Technol.* 11, 1–11. doi: 10.14456/ITJEMAST.2020.98

Hussain, S., Li, Y., and Li, W. (2020). Psychological contract-based consumer repurchase behavior on social commerce platform?: an empirical study. *KSII Trans. Internet Inf. Syst.* 14, 2061–2083. doi: 10.4067/S0718-18762021000100102

Iamandi, I. (2012). Empirical analysis on CSR communication in Romania: transparency and participation. *Rom. Econ. J.* 15, 25–50.

Islam, K. M. Z., Rumi, A. N., and Hoque, M. N. (2017). Bank specific determinants of commercial bank profitability in Bangladesh. *North South Bus. Rev.* 7, 41–58.

Jaakson, K., Vadi, M., and Tamm, K. (2009). Organizational culture and CSR: an exploratory study of Estonian service organizations. *Soc. Responsib. J.* 5, 6–18. doi: 10.1108/17471110910939962

Janney, J. J., and Gove, S. (2011). Reputation and corporate social responsibility aberrations, trends, and hypocrisy: reactions to firm choices in the stock option backdating scandal. *J. Manag. Stud.* 48, 1562–1585. doi: 10.1111/j.1467-6486.2010.00984.x

Jiang, L., and Yang, Q. (2015). *The Relationship Between Corporate Social and Financial Performance : Evidence from Chinese Heavy-Polluting*. Uppsala: Uppsala University.

Jose, S., Rugimbana, R., and Gatfield, T. (2012). Consumer responses to CSR driven microfinance strategy of banks-an empirical investigation based on India. *Int. J. Bus. Manag.* 7, 1–14. doi: 10.5539/ijbm.v7n21p1

Khan, Z., and Sulaiman, J. (2015). Social and financial efficiency of microfinance institutions in Pakistan. *Pak. Dev. Rev.* 54, 389–403. doi: 10.30541/v54i4I-IIpp.389-403

Khan, Z. A., Butt, S., and Khan, A. A. (2017). Determinants of financial self sufficiency in microfinance institutions: a study of Pakistan, India and Bangladesh. *Eur. Online J. Nat. Soc. Sci.* 6, 296–301.

Kuada, J., and Hinson, R. E. (2012). Corporate social responsibility (CSR) Practices of foreign and local companies in Ghana. *Thunderbird Int. Bus. Rev.* 54, 521–536. doi: 10.1002/tie.21481

Lee, K. H., and Shin, D. (2010). Consumers' responses to CSR activities: the linkage between increased awareness and purchase intention. *Public Relat. Rev.* 36, 193–195. doi: 10.1016/j.pubrev.2009.10.014

Lee, S., and Heo, C. Y. (2009). Corporate social responsibility and customer satisfaction among US publicly traded hotels and restaurants. *Int. J. Hospitality Manag.* 28, 635–637. doi: 10.1016/j.ijhm.2009.02.007

Lensink, R., Mersland, R., Vu, N. T. H., and Zamore, S. (2018). Do microfinance institutions benefit from integrating financial and nonfinancial services? *Appl. Econ.* 50, 2386–2401. doi: 10.1080/00036846.2017.1397852

Lin, C. H., Yang, H. L., and Liou, D. Y. (2009). the impact of corporate social responsibility on financial performance: evidence from business in Taiwan. *Technol. Soc.* 31, 56–63. doi: 10.1016/j.techsoc.2008.10.004

Lin, C. S., Chang, R. Y., and Dang, V. T. (2015). An Integrated model to explain how corporate social responsibility affects corporate financial performance. *Sustainability,* 7, 8292–8311. doi: 10.3390/su7078292

Loew, T., Ankele, K., Braun, S., and Clausen, J. (2004). Significance of the CSR debate for sustainability and the requirements for companies. *Nucl. Saf.* 16, 1–19.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., and Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychol. Methods* 7:83. doi: 10.1037/1082-989x.7.1.83

Malkiel, B. G. (2003). The efficient market hypothesis and its critics. *J. Econ. Perspect.* 17, 59–82. doi: 10.1257/089533003321164958

Malkiel, B. G. (2005). Efficient market hypothesis: 30 years later. *Financial Rev.* 40, 1–9. doi: 10.1111/j.0732-8516.2005.00090.x

Manokaran, K. R., Ramakrishnan, S., Hishan, S. S., and Soehod, K. (2018). The impact of corporate social responsibility on financial performance: evidence from insurance firms. *Manag. Sci. Lett.* 8, 913–932. doi: 10.5267/j.msl.2018.6.016

Marakas, G. M., Johnson, R. D., and Clay, P. F. (2007). The Evolving nature of the computer self-efficacy construct: an empirical investigation of measurement construction, validity, reliability, and stability over time. *J. Assoc. Inf. Syst.* 8, 16–46. doi: 10.17705/1jais.00112

Marques, P., Presas, P., and Simon, A. (2014). The heterogeneity of family firms in CSR engagement: the role of values. *Fam. Bus. Rev.* 27, 206–227. doi: 10.1177/0894486514539004

Marrewijk, M. V. (2003). Concepts and definitions of CSR and corporate sustainability: between agency and communion. *J. Bus. Ethics* 44, 95–105. doi: 10.1023/A:1023331212247

McWilliams, A., and Siegel, D. (2000). Corporate social responsibility and financial performance : correlation or misspecification? *Strateg. Manag. J.* 21, 603–609. doi: 10.1002/(SICI)1097-0266(200005)21:5<603::AID-SMJ101>3.0.CO;2-3

Meyer, J. (2019). Outreach and performance of microfinance institutions: the importance of portfolio yield. *Appl. Econ.* 51, 2945–2962. doi: 10.1080/00036846.2018.1564016

Moskowitz, M. (1972). Choosing socially responsible stocks. *Bus. Soc. Rev.* 1972, 71–75.

Moskowitz, M. (1975). Profiles in Corporate Responsibility. *Bus. Soc. Rev.* 1975, 29–42.

Murillo, D., and Lozano, J. M. (2006). SMEs and CSR: an approach to CSR in their own words. *J. Bus. Ethics* 67, 227–240. doi: 10.1007/s10551-006-9181-7

Naz, F., Salim, S., Rehman, R., Ahmad, M. I., and Ali, R. (2019). Determinants of financial sustainability of microfinance institutions in Pakistan. *Upravlenets* 10, 51–64. doi: 10.29141/2218-5003-2019-10-4-5

Nicolopoulou, K. (2011). Towards a theoretical framework for knowledge transfer in the field of CSR and sustainability. *Equal. Divers. Inclusion* 30, 524–538. doi: 10.1108/02610151111157738

Nurmakhanova, M., Kretzschmar, G., and Fedhila, H. (2015). Trade-off between financial sustainability and outreach of microfinance institutions. *Eurasian Econ. Rev.* 5, 231–250. doi: 10.1007/s40822-015-0016-7

Ofori, D. F., and Hinson, R. E. (2007). Corporate social responsibility perspectives of leading firms in Ghana. *Corporate Gov.* 7, 178–193. doi: 10.1108/14720700710739813

Platonova, E., Asutay, M., Dixon, R., and Mohammad, S. (2018). The impact of corporate social responsibility disclosure on financial performance: evidence from the GCC Islamic banking sector. *J. Bus. Ethics* 151, 451–471. doi: 10.1007/s10551-016-3229-0

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Rai, A., Kanwal, A., and Sharma, M. (2010). Financial sustainability of microfinance institutions: a new model approach. *Asia Pacific Bus. Rev.* 6, 12–17. doi: 10.1177/097324701000600402

Rai, A., and Rai, S. (2012). Factors affecting financial sustainability of microfinance institutions. *J. Econ. Sustain. Dev.* 3, 1–9.

Rhou, Y., Singal, M., and Koh, Y. (2016). CSR and financial performance: the role of CSR awareness in the restaurant industry. *Int. J. Hospitality Manag.* 57, 30–39. doi: 10.1016/j.ijhm.2016.05.007

Saunders, M. N. K., Lewis, P., and Thornhill, A. (2019). *Research Methods for Business Students, 8th Edn*. London: Pearson United Kingdom.

Sayekti, Y. (2015). Strategic corporate social responsibility, company financial performance, and earning response coefficient: empirical evidence on Indonesian listed companies. *Proc. Soc. Behav. Sci.* 211, 411–420. doi: 10.1016/j.sbspro.2015.11.054

Schäfer, K., and Fukasawa, Y. (2011). Factors determining the operational self-sufficiency among microfinance institutions. *Adv. Bus. Res.* 2, 172–178.

Shu, C. A., and Oney, B. (2014). Outreach and performance analysis of microfinance institutions in cameroon. *Econ. Res.Ekonomska Istrazivanja* 27, 107–119. doi: 10.1080/1331677X.2014.947108

Siano, A., Kitchen, P. J., and Confetto, M. G. (2010). Financial resourses and corporate reputation. *Corporate Commun. Int. J.* 15, 68–82. doi: 10.1108/13563281011016840

Sim, J., and Prabhu, V. V. (2014). The sustainability and outreach of microfinance institutions. *IFIP Adv. Inf. Commun. Technol.* 439, 286–293. doi: 10.1007/978-3-662-44736-9_35

Skudiene, V., and Auruskeviciene, V. (2012). The contribution of corporate social responsibility to internal employee motivation. *Baltic J. Manag.* 7, 49–67. doi: 10.1108/17465261211197421

Stubbs, W., and Schapper, J. (2011). Two approaches to curriculum development for educating for sustainability and CSR. *Int. J. Sustain. Higher Educ.* 12, 259–268. doi: 10.1108/14676371111148045

Sweeney, L. (2009). *A Study of Current Practice of Corporate Social Responsibility (CSR) and an Examination of the Relationship Between CSR and Financial Performance Using Structural Equation Modelling (SEM)*. Dublin: Dublin Institution of Technology.

Tang, Z., Clyde, E. H., and Rothenberg, S. (2012). How corporate social responsibility engagement strategy moderates the CSR-financial performance relationship. *J. Manag. Stud.* 49, 1274–1303. doi: 10.1111/j.1467-6486.2012.01068.x

Thomas, J. R., and Jyothi, K. (2016). Social performance and sustainability of indian microfinance institutions: an interrogation. *J. Sustain. Finance Invest.* 6, 38–50. doi: 10.1080/20430795.2015.1124237

Thorne, L., Lois, S. M., and Giacomo, M. (2014). Motivations for issuing standalone CSR reports: a survey of Canadian firms. *Account. Audit. Account. J.* 27, 686–714. doi: 10.1108/AAAJ-07-2013-1393

Torugsa, N. A., Wayne, D., and Hecker, R. (2012). Capabilities, proactive CSR and financial performance in SMEs: empirical evidence from an Australian manufacturing industry sector. *J. Bus. Ethics* 109, 483–500. doi: 10.1007/s10551-011-1141-1

Tsoutsoura, M. (2004). *Working Paper Series Title Corporate Social Responsibility and Financial Performance*. UC Berkeley Working Paper Series. Berkeley. Available online at: https://escholarship.org/uc/item/111799p2 (acceesed April 24, 2020).

Tuan, L. T. (2016). Organizational ambidexterity, entrepreneurial orientation, and i-deals: the moderating role of CSR. *J. Bus. Ethics* 135, 145–159. doi: 10.1007/s10551-014-2476-1

Tucker, M. (2001). Microfinance institutions benchmarking progress to sustainability. *J. Microfinance* 3, 107–123.

Vanroose, A., and D'Espallier, B. (2013). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Appl. Econ.* 45, 1965–1982. doi: 10.1080/00036846.2011.641932

Velnamby, T., and Alagathurai, A. (2014). Efficiency and financial sustainability of microfinance institutions-abstract. *Asian J. Multidimensional Res.* 3, 103–121.

Wafula, D. N., Mutua, S. M., and Musiega, M. G. (2017). Influence of financial performance on financial sustainability of microfinance institutions in Kenya. *Int. J. Manag. Commerce Innov.* 4, 295–302.

Wang, Q. J. D., and Shenghua, J. (2016). A meta-analytic review of corporate social responsibility and corporate financial performance: the moderating effect of contextual factors. *Bus. Soc.* 55, 1083–1121. doi: 10.1177/0007650315584317

Watts, R. L., and Zimmerman, J. L. (1978). Towards a positive theory of the determination of accounting standards. *Account. Rev.* 53, 112–134.

Woller, G. (2007). Trade-offs between social and financial performance. *ESR Rev.* 9, 14–19.

Yang, A. S., and Suvd, B. (2017). Exploring CSR and financial performance of full-service and low-cost air carriers. *Finance Res. Lett.* 23, 291–299. doi: 10.1016/j.frl.2017.05.005

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Green Innovation Practices and Its Impacts on Environmental and Organizational Performance

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This study aims to investigate the impact of stakeholders' views on the practices of green innovation (GI), consequent effect on environmental and organizational performance (OP), and moderating influence of innovation orientation. A quantitative method was employed for the sample size of 515 responses. To accumulate the data from the respondents, convenient random sampling was used. Data were collected from manufacturing and services firms through a field survey by using a closed-ended questionnaire based in the Punjab province of Pakistan. The analysis was done using the structural equation model of the partial least square analysis method. Our findings proved a positive and significant link between stakeholders' views on GI practices. A significant association has been found between GI practices and environmental and OP. The moderating effect was found to be negative but statistically significant. This research offers numerous contributions and provides decision-making insinuations.

Keywords: innovation orientation, competitor pressure, employees' conduct, green innovation, environmental performance, organizational performance

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INTRODUCTION

Resource limitations and environmental concerns have made sustainable operations of assets and environmental pollution one of the major global issues. The economy's overall development may not go "hand in hand" with the reduction of pollution and sustainable management of resources (Wang and Song, 2014). Building a sense of balance among high resource consumption and development of economy relics is a constant challenge that forces organizations to run-through eco-friendly professional deeds having high economic worth (Chan et al., 2012). Many organizations are forced to adopt activities that generate and increase economic value (Porter and Kramer, 2019).

The excessive use of non-renewable resources prompted by speedy economic development has hurt the atmosphere and elevated various environmental worries (Atlin and Gibson, 2017). To preserve energy and lessen emissions of carbon, numerous countries have established agencies and regulations for environmental sustainability and its protections; examples comprise limitations on "chlorofluorocarbons, the sustainable development announcements of the Johannesburg world summit," and limits on the usage of few hazardous materials "electrical and electronic equipment requirements, the European Union's Restriction of Hazardous Substances Directive" (Weng et al., 2015, p. 4998). Such impositions of rule and regulations have drawn the attention of environmental supervisors (Zhu and Sarkis, 2004; Claver et al., 2007); they also have the same outcome in

varying the management and competition practices between the organizations (Feng and Chen, 2018). To adhere to the new eco-friendly regulations, to have a positive branding image (Chen, 2008a; Hillestad et al., 2010), to improve their firms' performance and to have a competitive advantage (Claver et al., 2007; Rusinko, 2007), organizations have had to accept eco-friendly practices (Afridi et al., 2020).

Numerous investigations examined factors altering green innovations (GI) practices, such as environmental regulations, ethics, legal systems, and supply chain (Feng and Chen, 2018; Gao et al., 2018; El-Kassar and Singh, 2019; Seman et al., 2019). Studies have also examined an increase in awareness, the general public, and stakeholder pressure linked to green environmental issues (Foo, 2018). Moreover, literature provides evidence of optimized pressure from society, customers, and government bodies to practice GI. However, the literature lacks findings on the relationship of stakeholders' pressure [competitor's pressure, government pressure, and employee conduct (EC)] about GI practices. The manufacturing sector faces higher stakeholder pressure due to possibly the highest waste-producing sector (Chen, 2008b; Chang, 2011). The single industry was studied for GI practices (Cordano et al., 2010; Lin and Ho, 2011). This study fills the gap in investigating these constructs in the manufacturing and service industries to enrich existing GI practices and stakeholder pressure literature. Moreover, stakeholder pressure (customer) was examined for GI in third party logistic firms (Chu et al., 2019), as well as in express companies (Zhang et al., 2020), and in manufacturing firms (Song et al., 2020). Those three studies were conducted in China's context, which highlights the issue of conducting and focusing on the stakeholder pressure in the manufacturing and service industries of Pakistan being a developing economy in the initial stages of GI practices adoption (Shahzad M. et al., 2020).

"Go-green" is an initiative mainly employed by firms to deal with eco-friendly problems. Approaches to attain green abilities and emerging eco-friendly practices have focused on attention and discussion in the management sciences' discipline over the years (Ullah, 2017). To ease the acceptance of GI, firms must consider the significant factors and precursors in their business entities (Arfi et al., 2018). These comprise apprehensions of consumers (Zhu et al., 2017), preferences of professionals and owners (Huang et al., 2009), competency of suppliers and partners (Chiou et al., 2011), government regulating authorities and their regulations (Kammerer, 2009), and the environmental, technological, and organizational factors of GI practices (Lin and Ho, 2011). Green technologies consist of GI practices (e.g., green product, process, managerial, and marketing innovation) and the execution of green human resource management practices (e.g., green training and development, administrative support and culture, recruitment and selection, compensation, and benefits). GI is a significant strategic enabler to acquire justifiable development, as it practices energy-saving, environment-protecting, waste-recycling, and pollution-preventing methods (Albort-Morant et al., 2018). Furthermore, GI can be divided into green product, green marketing, green processes, and green management that are intended for eco-friendly environment, decreasing consumption of energy and increasing efficient use of the resource, control over pollution emission, and waste recycling, improving the performance of the organization and providing the pollution-free environment to society at large scale (Seman et al., 2019).

Previous studies have witnessed some proofs of the impacts of numerous drivers such as corporate environmental ethics (El-Kassar and Singh, 2019), environmental regulations (Feng and Chen, 2018), the legal system (Gao et al., 2018), and green supply chain management practices (Seman et al., 2019) on GI practices. To date, some systematic and comprehensive investigations of the precursors and factors of GI have been performed. Foo (2018) proposed that the increase in awareness and pressure from the stakeholders and the general public have necessitated organizations to be more transparent in facing and handling green environmental issues of their supply base execution. Hence, it is critical to focus on stakeholders' views in an organization on establishing and sustaining GI abilities and practices. Then executives of organizations are involved in examining the essential factors necessary for creating GI practices. Are there pressures from established institutions' regulations and competitor's critical factors of GI? How should firms have dealt with the concerns of both internal and external stakeholders?

Furthermore, previous studies have concentrated on the manufacturing sector as it is one of the most critical waste producers that upset the balance of an environment. With rising trepidations on global pollution, this industry is facing increasing pressures from customers, society, and governing agencies to save energy, resources, protect the eco-friendly environment and maintain its sustainability (Chen, 2008b; Chang, 2011) or on a single industry (e.g., Cordano et al., 2010; Lin and Ho, 2011). It would be beneficial to offer an all-purpose model to investigate issues about GI for both the service and manufacturing firms. Therefore, in this study, we borrowed help from the "stakeholder theory" (Freeman, 2010) to aid in our investigation methodology. This theory has been utilized to get a comprehensive view of a particular organization to examine stakeholders' influence (participants) on GI practices. To answer the stakeholders' pressure, organizations should focus on an overall strategic plan that involves and satisfies both internal and external stakeholder groups (Bryson, 2018).

REVIEW OF LITERATURE

Stakeholder View (SV)

The word "stakeholders" was initially used by the "Stanford Research Institute" in 1963 and was defined as "those groups without whose support the organization would cease to exist" (Friedman and Miles, 2006). While this concept was first brought into a "strategic discipline" in 1984 by Freeman (1984), stakeholders were not only separate from shareholders but also involved in the decision-making process (Donaldson and Preston, 1995; Mitchell et al., 1997). In an academic view, the "stakeholder theory" holds a unique perspective for the organizations and offers a diverse description of a firm's structure and everyday actions (Sulkowski et al., 2018). The stakeholder

theory, founded on four indispensable grounds (Jones and Wicks, 1999), first suggests that organizations have associations with several procedures, all of which are upset or pretentious by their results (Laplume et al., 2008; Co and Barro, 2009). Second, such links are recognized in the firms' procedures and results and their stakeholders' firms' views.

Third, stakeholders' inherent value, and comforts cannot be permitted to override the safeties of others (Clarkson, 1995; Co and Barro, 2009). Fourth, the decision making of the organizations is the central point (Alrowwad et al., 2017). Stakeholder theory has been accepted for numerous ecological scholarships in that it has been active in persuading both company environmental sensitivity (Crane and Livesey, 2017) and environmental policies (Salem et al., 2018). Although the outcomes have been mixed, and the stakeholders' views on ecological management have been unpredictable. For example, Jaaffar and Amran (2017) found that the organizations' board of directors is involved in deciding eco-friendly strategies and policies while small business entities and proprietors decide GI (Huang et al., 2009). In addition, in manufacturing organizations in Germany, stakeholders have affected the firms' selections concerning ecological response forms (Murillo-Luna et al., 2008), and they were confidently related with unproved GI (Wagner, 2007); in contrast, the association among eco-friendly policies and stakeholders' administration was not perfect in Belgian organizations (Buysse and Verbeke, 2003). The review paper by Seman et al. (2018) concludes that the stakeholders' views have a more considerable influence on GI practices.

Green Innovation (GI)

Works of GI are commonly divided into two types. The first describes GI as a firm's abilities (Gluch et al., 2009), whereas the second defines GI as an organization's environmental practices (Lin and Ho, 2008; Ho et al., 2009). When it comes to organizational practices, GI is described as "the hardware or software innovation related to green products or processes" (Song and Yu, 2018); it is proposed that GI comprises management practices and technological advancements that expand the environmental and organizational performance (OP) and provide a competitive edge to the firms (Rennings, 2000). Other researchers recommend that GI consists of unique or altered systems, processes, products, and practices that provide an advantage to the environment and subsidize firms' sustainability (Xie et al., 2019).

A recent study expresses GI as "the new or modified products and processes, including technology, managerial, and organizational innovations, which helps to sustain the surrounding environment" (Ilvitskaya and Prihodko, 2018). Moreover, GI may refer to "a creative initiative that reduces negative environmental impacts or that yields environmental benefits as it creates value in the market" (Chen et al., 2006). GI is divided into two kinds, such as "green product innovations" (providing new green products to consumers) and "green process inventions" or "greening" business procedures (Tang et al., 2018). Furthermore, due to the growing customer-centered apprehensions concerning environmental protection, ecological management has become a critical part of many firms' strategic policies and tactical plans (Chiou et al., 2011; Khan et al., 2019).

Regulations related to an environment may lead toward a "win-win situation" (Chan et al., 2018) since they can perform dual tasks, increase profits and lessen pollution; It is proposed that GI should be categorized distinctively from other innovative maneuvers since it harvests not only a spillover consequence for exploration and expansion efforts but also optimistic external possessions such as enlargements in the atmosphere (Kammerer, 2009). A study by Feng et al. (2018) on the Chinese industry's manufacturing firms has shown that internal and external environmental orientation is significantly associated with GI practices. The utilization of GI practices inside and outside the firms' restrictions are vital for impacting both economic and ecological performance goals (Khan and Qianli, 2017; Saeed et al., 2018). Moreover, Lee et al. (2018) found that stakeholders' pressure, organizational support, and societal expectations were significant factors for the motivation to adopt GI practices and corporate environmental responsibility (Shahzad F. et al., 2020). Moreover, the study of Fernando et al. (2019) showed that GI, regulation, supplier intervention, and technology have a strong influence on sustainable performance mediated by service innovation capabilities. The study by Famiyeh et al. (2018) also supported eco-friendly practices, showing that environmental management practices have direct and indirect positive effects on environmental performance. Xie et al. (2019) used green product innovation as a moderator for the green process innovation and OP, but the study did not find the supported results.

PROPOSED FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Proposed Framework

This study involves the three dimensions of stakeholders' view (e.g., competitor pressure, government pressure, and employees conduct) as independent variables. Organizational and environmental performance are used as dependent variables. Moreover, GI practices (e.g., green product and green process) are used as mediators, and the moderating role is performed by innovation orientation (IO). A total of six hypotheses have been suggested and showed in **Figure 1**.

Hypothesis Development

We followed "Freeman's stakeholder framework" (Freeman, 2010). We used three stakeholders' dimensions to view the government's and competitors' pressure as external and employees' conduct as internal stakeholders. However, there are various other dimensions, such as customer, community, and supplier pressure. This study also treats both aspects of stakeholder's views as factors that are employing pressure on the organizations and motivating the firms to improve environmental practices. Identifying eco-friendly business practices are becoming critical elements as organizations are confronted with "both internal and external forces/pressures from environmental agencies, governmental regulations, stakeholders, competitors, customers and employees"

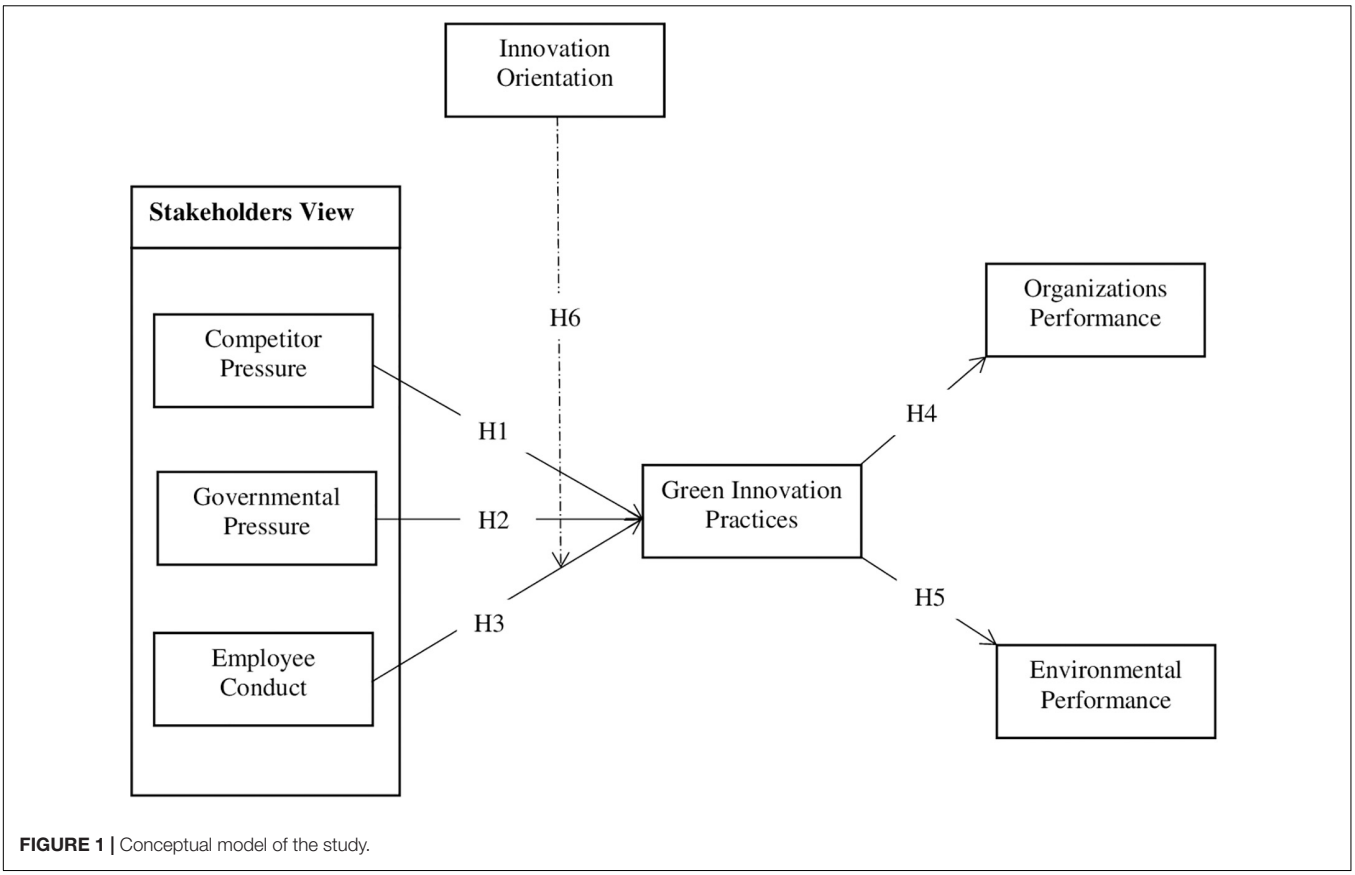

FIGURE 1 | Conceptual model of the study.

(Wang and Song, 2014). Singh and El-Kassar (2018) conclude that the stakeholders' view (e.g., pressure by the government, competitors, employees, customers, society, and suppliers, respectively) positively influences the GI practices.

Competitors Pressure (CP)

Organizations generally act in response to the movements of rivals and the operating industry. When competitors accept or implement new eco-friendly practices, organizations in the same sector will feel overstretched to reconfigure the structures and policies (Durand and Georgallis, 2018). In short, organizations need to be attentive to their competitor's products/services, actions, and norms and regulations of the industry they are part of so that their innovation abilities are similar to others in the industry. For instance, organizations must be conscious of new energy-saving, waste-recycling, pollution-preventing methods, and changes in processes used for the implementation and paraphernalia that are accessible in the market. They are required to have an eye on the methods their competitors have adopted to lessen energy costs while restructuring process and reconfiguring their manufacturing facilities to overtake/perform equivalent to/better than their rivals. Thus, to endure competitive spots, organizations may emulate competitors' environmental practices and actions, especially the front-runners in their industries (Abrahamson and Rosenkopf, 1993). Singh and El-Kassar (2018) found a positive relationship between stakeholders' views and GI practices. Furthermore, a study on 442 Chinese firms also confirmed that competitors' pressure provides organizations with more significant incentives to adopt GI practices (Cai and Li, 2018). In another study (Yu, 2019), the results revealed that formal and informal environmental regulation and pressures have strong influences on food-making companies' GI activities. Thus, hypothesis 1 is established:

H_1: Competitor's pressure has a significant impact on GI practices.

Governmental Pressures (GP)

Various scholarships have explored the association among regulatory rules and environmental practices and have proposed that governmental pressures (GP) is a crucial factor of external stakeholders (He et al., 2018). Variations in regulations and implementation of these changes by the government disturb organizational activities concerning environmental management (Yakubu, 2017). In particular, to compete internationally, organizations must keep an eye on both international and national laws to overcome any obstacle. The consistency of the rules and organizations' insights into the severity of the regulations will define the degree to which firms essentially execute environmental prevention practices (Bernauer et al., 2007). The appropriate governance mechanisms and structural design can successfully manage and supervise the association between nature and mankind (Famiyeh et al., 2018). Moreover, Tirabeni et al. (2019) showed that organizations are reevaluating their manufacturing processes in response to

"societal and governmental" pressures concerned with eco-friendly well-being. Furthermore, the degree to which the government enforces/supports the regulations has a substantial influence on the firms' environmental strategies (Lindell and Karagozoglu, 2001; Zeng et al., 2011), creating a significant task to examine. A study by Zhang et al. (2019) on 224 firms of the manufacturing industry found that institutional pressure significantly affects green supply chain management practices and business performance. In a study by Huang et al. (2016), results show that customer and regulatory pressure encourage green response and increase performance. A survey by Fernando and Wah (2017), based on Malaysian firms, concluded that compliance with government regulations impacts environmental performance. Hence, we suggest hypothesis 2:

H_2: Governmental pressure has a significant impact on GI practices.

Employee Conduct (EC)

Top management identifies the significance of environmental prevention and their responsibility to impact strategic planning and long-term goals related to environmental management. Steady appreciation and consideration of environmental drivers by the management should produce improved innovation and overall performance. Additionally, an organization's future direction of ecological practices/activities mostly depends on the top management's commitment toward the utilization of green practices and whether the executives can motivate employees to actively contribute to environmental management (Tang et al., 2018). The same circumstances exist between employees. In a business, workforces are often the originators of environmental practices (Daily and Huang, 2001). Organizations will strain to achieve ecological goals if the personnel/workforce do not contribute to their policies and strategies (Zhu et al., 2008). Thus, firms must arrange and offer workshops and training on environmental concerns, include suitable employees, and improve their obligation to eco-friendly practices (Reinhardt, 1999). Yen and Yen (2012) investigate the inside drivers motivating organizations to utilize green activities such as the top management commitment and relationships with vendors. The authors found a direct association between the proposed constructs of the study.

Furthermore, Gholami et al. (2013) examined senior managers' perceptions about situations and the significances of using green practices. They presented that green technology acceptance, top management attitude, and apprehension for potential concerns are significantly interrelated. Moreover, they found an optimistic connection between the adoption of green practices and overall performance. The results from Cao and Chen (2018) study show that when the top management's awareness increases, the association between coercive policies and GI strategy becomes stronger. Soewarno et al. (2019) propose that executives are responsible for making GI strategies that have to be implemented by employees. Such innovation strategies positively influence GI if applied appropriately. Thus, we propose hypothesis 3:

H_3: EC has a significant impact on GI practices.

Environmental Performance

In this study, we have assessed the firms' overall performance into two types: environmental and organizational. Environmental performance (EP) can be defined as "the environmental impact of a company's activities on the natural surroundings" (Klassen and Whybark, 1999). OP includes numerous elements, both financial and non-financial (e.g., market share, reputation, sales volume, stakeholders satisfaction, etc.) (Venkatraman and Ramanujam, 1986).

Environmental performance encompasses the inclusion of eco-friendly ingredients in products, less pollution, reduced carbon emissions and waste at the source, advancements in energy-savings, efficiency in utilization of resources, reduction in the use of environmentally hazardous elements, etc. (Zhu et al., 2010). Related to long-term ecological impacts, an organization's regulatory methods, processes, practices including pollution protection, as well as resource utilization and waste lessening, are more fruitful than "end-of-pipeline solutions" (Sarkis and Cordeiro, 2001; De Giovanni, 2012; Khan et al., 2019). Previous scholarships proposed that advancement in the production process and efficiency will upsurge opportunities to advance environmental performance (Montabon et al., 2007). Along with these, a study by Seman et al. (2019) on the 123-manufacturing industry showed that GI practices significantly improve environmental performance. Hence, we established hypothesis 4:

H_4: GI practices have a significant impact on environmental performance.

Organizational Performance

Organizational performance can be assessed both "financially and non-financially" (Gounaris et al., 2003). To control environmental costs, organizations raise their productivity by adopting GI practices (de Burgos-Jiménez et al., 2013). Similarly, organizations can establish new markets and upsurge their market share by employing and adopting environmental activities and practices (Berry and Rondinelli, 1998; Berrone et al., 2017). A long-term organization goal, advancement into non-monetary performance can be demonstrated by enlarged customer loyalty, newly joined customers, and an improved image and reputation of an organization (Blazevic and Lievens, 2004). Chen (2008a) suggested that innovators in GI will gain the "first-mover advantage," which indicates an improved firm image, higher product prices, competitive advantages, and new market opportunities. A study by Tang et al. (2018) shows that GI practices have positive effects on OP. Moreover, a study by Zhang and Walton (2017) on 83 New Zealand firms concludes that GI has a positive influence on the firms' performance. Thus, hypothesis 5 is constructed:

Hypothesis 5: GI practices have a significant impact on OP.

This study used IO as a moderator. It tested its effect on the association among EC and GI practices because the variable is allied with organizations' policy settings and culture, which primarily correlate to the firm's employees.

Innovation Orientation

Innovation orientation is a strategic orientation that disturbs firms' innovation practices and functions as a guiding standard for making strategy and enactment to increase an organization's innovativeness (Chen et al., 2011; Stock and Zacharias, 2011). It defines a firms' "openness to new ideas, technologies, skills, resources, and administrative systems" (Zhou et al., 2005) and a knowledge-sharing system that unites a learning viewpoint, strategic guidelines, and *trans*-functional acclimation within a firm to encourage innovation (Siguaw et al., 2006). IO is a crucial factor in overwhelming competitors and advancing an organization's capability to effectively execute new products, services, systems, and processes (Oke, 2007). Organizations with a new innovative environment and management will motivate and encourage employees to commence innovative conduct (Ramus, 2018). Thus, we assume that an IO can advance the association between EC and GI practices, as exemplified in hypothesis 6:

H_6: IO significantly moderates EC on GI practices.

RESEARCH METHODOLOGY

Instrument

Based on a review of the literature, we considered a structured closed-ended questionnaire with 7 s. The first section includes the demographical information of respondents. The second to seventh sections include the measurement items related to specific construct's competitors' pressure, governmental pressure; EC; IO; GI practices; environmental performance, and OP. To ensure the validity of the questionnaire and data, two pilot studies were conducted. After that step, we adopted a field survey on a large scale. All of the construct's items were measured using "five-point Likert-type scales in which 1 = strongly disagree, 5 = strongly agree."

Data Collection and Sample

Data were collected from January 2019 to July 2019 from the manufacturing and services firms of Punjab province in Pakistan that have adopted GI practices. Convenient random sampling techniques were adopted for selecting areas of the country. Most of the organizations are based in Lahore, Faisalabad, Sheikhupura, Gujranwala, and Multan. Data collected by field surveys targeted the population, including the executives of different departments such as marketing, human resource, productions, operations, and other functional managers. After the pilot study's conduction, 550 questionnaires were distributed among the respondents, out of which 520 were filled and returned. This resulted in a response rate of 94.54% from a random sampling method for data collection. Five forms were removed from the analysis due to incomplete information, and the remaining 515 were used in the analysis.

Measures of the Constructs

This study adopted a quantitative research technique and a closed-ended questionnaire used for data collection. All of the variables were assessed with multiple-item scales. In total, 46 question items, mainly related to the constructs, were used. Competitor pressure was appraised by acclimating four items from preceding studies (Christmann, 2004). GP were measured by four items scale adapted from the studies of Zeng et al. (2011) and Qi et al. (2010). EC was measured by four items scale taken from Lindell and Karagozoglu (2001) studies and López-Gamero et al. (2008). IO was measured by seven items scale gained from the studies of Hurley and Hult (1998); Zhou et al. (2005), and Siguaw et al. (2006). In this study, GI practices were measured by nine items scale taken from the study of Chiou et al. (2011). OP measured by eight items scale adapted from the study of Blazevic and Lievens (2004) and Avlonitis et al. (2001). Moreover, the environmental performance was measured by six items scale adapted from Lin (2013) studies.

Common Method Bias

We used Harman's single factor test to check the issue of common method bias in the data. As per Harman's methodology, if all the factors merged into factor analysis, and the first factor explains more than 50% of the data variance, there is an issue of common method bias. Therefore, we used the dimension reduction method in SPSS and merged all the factors into one factor using a rotation matrix. The first factor's results explained 38.23% of the total variance, which is less than 50% of the variance. Thus, common method bias is not considered as the problem in this study.

DATA ANALYSIS AND RESULTS

This study used the partial least squares (PLS) procedure of structural equation modeling using Smart-PLS Version 3.0 to assess the research model. This procedure was designated due to the investigative nature of the study (Hair et al., 2011). As recommended by Hair et al. (2013), this research applied a two-step method for statistical analysis. In the first step, the measurement model was analyzed. In the second step, the structural relationships among the latent constructs were assessed. This tactic was used to conclude both the reliability and validity of the theoretical variables before the model's structural relationship was tested. Furthermore, Smart-PLS's main reason includes the extensive popularity and acceptability of its application (Hair et al., 2012). It also includes comprehensive information about the variables (Hair et al., 2011).

Sample Demographics

A sample of 515 employees represents the telecommunication sector population in China, and demographical representation was shown in **Table 1**. 392 (76.1%) respondents are male, and the rest, 123 (23.9%) respondents are female. Also, 246 (47.8%) respondents fall in the range of 31–40 years, followed by 219 (42.5%) in 20–30 years. From the education perspective, 291 (56.5%) respondents have a master's degree, followed by 216 (41.9%) with a graduation degree, and the remaining (1.6%) with higher than master degree education, respectively. Furthermore, 218 (42.3%) respondents have a job in the sales and marketing department, 209 (40.6%) selected "other options," apart from

TABLE 1 | Demographical information.

	Frequency	%
Gender		
Male	392	**76.1**
Female	123	23.9
Total	515	100
Age		
20–30	219	42.5
31–40	246	**47.8**
41–50	50	9.7
Total	515	100
Education		
Graduation	216	41.9
Master's Degree	291	**56.5**
Higher Than Master's Degree	8	1.6
Total	515	100
Department		
HR	35	6.8
Financial	8	1.6
Sales and Marketing	218	**42.3**
Other	209	40.6
Total	515	100
Work Experience		
1–5 years	127	24.7
5–10 Years	260	**50.5**
11–15 Years	125	24.3
Total	515	100
Salary (Rupees)		
Below 20,000	11	2.1
40,000–60,000	159	30.9
Above 60,000	168	**32.6**
Total	515	100
Marital Status		
Married	333	**64.7**
Single	182	35.3
Total	515	100

Bold values are the highest percentage values.

the HR and finance department. As for work experience, 260 (50.5%) respondents have 5–10 years of experience, followed by 127 (24.7%) with 1–5 years and the rest (24.3%) with 11–15 years of experience, respectively. As mentioned in the table below, 168 (32.6%) respondents have a monthly income of more than 60,000 rupees. Out of 515 respondents, 333 (64.7%) are married, and the rest, 182 (35.3%), are single.

Measurement of Model

The partial least square method was used to measure the reliability and validity of the respective constructs. The constructs' internal reliability was evaluated by "Cronbach's Alpha (CA), and Composite reliability." According to Gefen et al. (2000) and Hair et al. (2013), CA should be greater than 0.7. Moreover, Hinton (2014) categorized four ranges of CA. First, if the value falls in the range of 0.9, it falls in the area of excellent reliability. Second, if it falls between 0.7 and 0.9, it will have high reliability. Third, if it is in the range of 0.5 to 0.7, it will fall into the moderate area. Fourth, if it is <0.5, it will be categorized as low. **Table 2** shows that all of the variables have values (e.g., CP = 0.851; GP = 0.829; EC = 0.851; IO = 0.764; GIP = 0.829; EP = 0.799; and OP = 0.892) which fall into the range of high reliability. Furthermore, to evaluate the convergent validity, the average variance extracted (AVE) is used. Fornell and Larcker (1981) and Bagozzi and Yi (1988) propose that AVE's value should be greater than 0.5. As per results found in the table, all the values of constructs (0.691; 0.654; 0.627; 0.585; 0.598; 0.651; and 0.650) satisfied the rule of thumb. Chin (1998) recommended that loadings have a value greater than 0.5 because it indicates the constructs' reliability. The item's value can be between 0.4 and 0.7, as the value is also used by Umrani et al. (2018). Hence, all the loading values are found in the range of 0.477 to 0.894. Hence, it is proved that all the values satisfied the rule of thumb established by the scholars.

Two methods were used to evaluate the discriminant validity (e.g., used to measure either construct used in the study well defined). Each construct is pure and not any multicollinearity involved. The dependent variable was evaluated by considering the correlations between the measures of hypothetically intersecting variables) of the variables. First, it was ensured that the cross-loadings of indicators should be greater than any other opposing constructs (Hair et al., 2012). Second, according to the criterion of Anderson and Gerbing (1988) and Fornell and Larcker (1981), the "square root of AVE for each construct should exceed the inter-correlations of the construct with other model constructs" (**Table 3**). Hence, both methods ensured the satisfaction of the results and validity. All the results found in the study meet satisfactory status.

Another essential technique of partial least square to assess the model's validity and multicollinearity includes the Heterotrait–Monotrait ratio. According to Henseler et al. (2015). HTMT is the ratio of trait correlation to within correlation. The belief that if the HTMT value is going to increase >0.9, it will lack the discriminant validity, as mentioned in **Table 4**. Furthermore, it is considered one of the most crucial technique to measure the multicollinearity.

Structural Model

The table given below contains the values of the coefficient of determination. It shows the percentage change in the dependent variable incurred because of independent variables. Hair et al. (2010) defined it as the proportion determined by independent variables. In other words, it tells how much change in dependent variable incurs because of the independent variable. **Table 5** shows three models. In the path – 1: R^2 of GI practice, have a positive coefficient 0.716, and adjusted R^2 0.713. It entails that 71.6% of changes in GIP incur because of all the independent variables. Path – 2 exhibited a 31.7% change in EP. While path – 3 showed a 31.6% change in OP incurred because of all the independent variables. According to Hair et al. (2011) and Henseler et al. (2015), three values of the coefficient of determination, 0.75, 0.5, or 0.25, which are called substantial, moderate, or weak, respectively. If the co-efficient of determination falls within the range of 0.75 or greater, it will become significant. If it is between 0.25 and 0.75, it will become

TABLE 2 | Measurement model.

Constructs	Items	Loadings	CA	CR	AVE
Competitor Pressure			0.851	0.899	0.691
Industry initiatives/associations advocate the simple mentation of worldwide environmental standards by firms.	CP1	0.810			
Our major competitors set worldwide environmental standards for their operations and products.	CP2	0.829			
Our major competitors implement environmental strategies on a worldwide basis.	CP3	0.857			
Environmental strategies that we implement in one country affect considerably our environmental reputation with competitors in other countries.	CP4	0.828			
Government Pressure			0.829	0.882	0.654
Regulation for green construction is stringent.	GP1	0.894			
Future regulation for green construction is predictable.	GP2	0.699			
Regulations for green constructions have considerable impact on business entities.	GP3	0.798			
Regulations for green constructions effectively deal with issue regarding greening of construction process.	GP4	0.832			
Employees Conduct			0.851	0.894	0.627
The top management's behavior inspired the acceptance of change by all the other organization members.	EP1	0.810			
The employees were able to take initiatives and decisions on their own thanks to the encouragement of authority delegation.	EP2	0.833			
The employees were aware of the progress made in their work are as new knowledge, new practice development.	EP3	0.803			
All the organization members knew and shared the firm's mission and objectives.	EP4	0.746			
Innovation orientation			0.764	0.848	0.585
Technical innovation, based on research results, is readily accepted.	IO1	0.737			
Management actively seeks innovative ideas.	IO2	0.660			
Innovation is readily accepted in program/project management.	IO3	0.823			
People are penalized for new ideas that don't work.	IO4	0.826			
Our firm pays close attention to innovation.	IO5	0.762			
Our firm emphasizes the need for innovation for development.	IO6	0.742			
Our firm promotes the need for development and utilization of new resources.	IO7	0.822			
Green Innovation Practices					
Lower consumption of e.g., water, electricity, gas, and petrol during production/use/disposal.	GIP1	0.809	0.829	0.881	0.598
Recycle, reuse, and remanufacture materials or parts.	GIP2	0.863			
Use of cleaner or renewable technology to make savings (such as energy, water, waste.)	GIP3	0.698			
Redesign of production and operation processes to improve environmental efficiency.	GIP4	0.666			
Redesigning and improving products or services to meet new environmental criteria or directives.	GIP5	0.813			
The company uses less or non-polluting/toxic materials that are environmentally friendly.	GIP6	0.852			
The Company uses materials that are easy to recycle, reuses, and decompose.	GIP7	0.782			
The Company recovers company's end-of-life products and recycling.	GIP8	0.721			
The company uses eco-labeling.	GIP9	0.790			
Organizational Performance			0.892	0.918	0.650
The use of green innovation increased your sales directly (form environmental friendly products).	OP1	0.800			
The use of green product increased your overall sales (from other types of products as well).	OP2	0.846			
The use of green innovation preserved your current customers.	OP3	0.826			
The use of green innovation attracted new customers.	OP4	0.737			
The use of green innovation increased your market share.	OP5	0.832			
The use of green innovation increased your overall profitability.	OP6	0.791			
The use of green innovation enhanced the financial position of the firm.	OP7	0.812			
The use of green innovation enhanced the firm's mental image among customers.	OP8	0.784			
Environmental Performance			0.799	0.877	0.651
Reduction of air emission.	EP1	0.890			
Reduction of hazardous waste/scrap.	EP2	0.889			
Reduction in consumption of gasoline/fuel.	EP3	0.891			
Partnership with green organizations and suppliers.	EP4	0.852			
Improvement of environmental compliance.	EP5	0.799			
Use of environmentally friendly material.	EP6	0.762			

CA, Cronbach's Alpha; CR, Composite Reliability; AVE, Average Variance Extracted.

TABLE 3 | Discriminant validity coefficients.

	1	2	3	4	5	6	7
CP	**0.831***						
EC	0.751	**0.792***					
EP	0.606	0.462	**0.807***				
GP	0.50	0.493	0.42	**0.809***			
GIP	0.777	0.705	0.563	0.544	**0.773***		
IO	0.802	0.684	0.517	0.478	0.709	**0.765***	
OP	0.465	0.502	0.429	0.797	0.562	0.472	**0.806***

**Bold values represent the square root of average variance extracted (AVE).*

TABLE 4 | Heterotrait – Monotrait (HTMT) ratio.

	1	2	3	4	5	6	7
Competitor pressure							
Employee conduct	0.846						
Environmental performance	0.604	0.493					
Governmental pressure	0.444	0.478	0.351				
Green Innovation Practices	0.778	0.717	0.55	0.486			
Innovation orientation	0.667	0.65	0.424	0.379	0.75		
Organizational performance	0.496	0.572	0.454	0.749	0.614	0.445	

TABLE 5 | Analysis of R^2.

Path	R square	R square adjusted	Decision
1. GI practices	0.716	0.713	Moderate
2. Environmental performance	0.317	0.315	Moderate
3. Organizational performance	0.316	0.315	Moderate

moderate. If it falls below 0.25, it will be considered weak. Hence, the study's value, which is shown in the table underneath, falls in a moderate range.

Analysis and Discussion

The competitors' pressure, governmental pressure, EC, and GI practices are concentrated on environmental and OP. The manufacturing and servicing industries of the country were examined, which account for greater than 70% contribution to the GDP of the country. A cohesive framework was developed under the investigation of theory, and it stated that the stakeholders' dimensions have positive and significant effects on the GI practice, and which, in turn, has positive and significant impacts on environmental and OP.

In the study, six hypotheses were constructed. Among them, five were a direct hypothesis, and one was proposed for the moderation effect. As exhibited in **Table 6** and **Figure 2**, the first direct hypothesis H_1 related to the influence of competitor pressure on GI practices. The findings show that competitive pressure positively and significantly impacts GI practices with a coefficient value of 0.271, t-value 5.543 $>$ 2, and p-value 0.000 $<$ 0.05. The hypothesis results were found consistent with the study of El-Kassar and Singh (2019). Moreover, we tested H_2 governmental pressure positively related to GI practices. The results indicate that governmental pressure positively and

TABLE 6 | Path coefficients and hypothesis testing.

Hypothesis	Relationship	Path coefficient	S. D	t-value	p-value	Decision
Direct effect						
H_1	CP→GIP	0.271	0.049	5.543	0.000**	Supported
H_2	GP→GIP	0.123	0.027	4.598	0.000**	Supported
H_3	EC→GIP	0.185	0.042	4.368	0.000**	Supported
H_4	GIP→EP	0.563	0.038	14.653	0.000**	Supported
H_5	GIP→OP	0.562	0.035	16.15	0.000**	Supported
Moderating effect						
H_6	IO × EC→GIP	−0.063	0.02	3.137	0.002	Supported

***p-value = 0.05, t-value = 2.*

significantly impacts GI practices with a positive coefficient value of 0.123, t-value 4.598 $>$ 2, and p-value 0.000 $<$ 0.05. The second direct hypothesis H_2, won the vote of support and was consistent with the results from a previous study of Sezen and Çankaya (2013) and Fernando and Wah (2017). Our third hypothesis, H3, is associated with EC and GI practices. The output illustrates that EC positively influenced GI practices with coefficient value of 0.185, t-value 4.368 $>$ 2, and p-value 0.000 $<$ 0.05. Hypothesis results were found consistent with the study of Yen and Yen (2012), Gholami et al. (2013), and Soewarno et al. (2019).

Furthermore, we discussed the H_4 the direct effect of GI practices on OP. The findings show that GI practices positively and significantly affect OP with a positive coefficient value of 0.563, t-value 14.653 $>$ 2, and p-value 0.000 $<$ 0.05. Hypothesis results were consistent with the previous study of Seman et al. (2019). Besides, we tested the direct effect of GI practices on environmental performance. We found that GI practices positively related to environmental performance with a positive coefficient of 0.562, t-value 16.15 $>$ 2, and p-value 0.000 $<$ 0.05. The hypothesis was supported and consistent with the studies of Zhang and Walton (2017) and Tang et al. (2018). Finally, the sixth hypothesis H_6 was constructed for moderation interaction effects, and its results were found statistically significant with a negative coefficient value of −0.063, t-value 3.137 $>$ 2, and p-value 0.000 $<$ 0.05. In conclusion, the results of all direct hypotheses were found with a positive path coefficient and statistically significant with a t-value $>$ 2 and p-value $<$ 0.05 and the interaction graph presented in **Figure 3**. However, the moderation hypothesis was found statistically significant, with a negative coefficient value. Therefore, it is proven that all the variables used in the study affect GI practices and the firms' overall performance.

CONCLUSION AND IMPLICATIONS

Conclusion

"Go green" has been forcing internationally dynamic organizations to improve their green competencies endlessly, execute GI practices to prevent the environment from degrading further, and advance overall firms' performance. Therefore, this study aims to identify the key factors affecting on the GI practices and its impact on OP from stakeholders' perspectives.

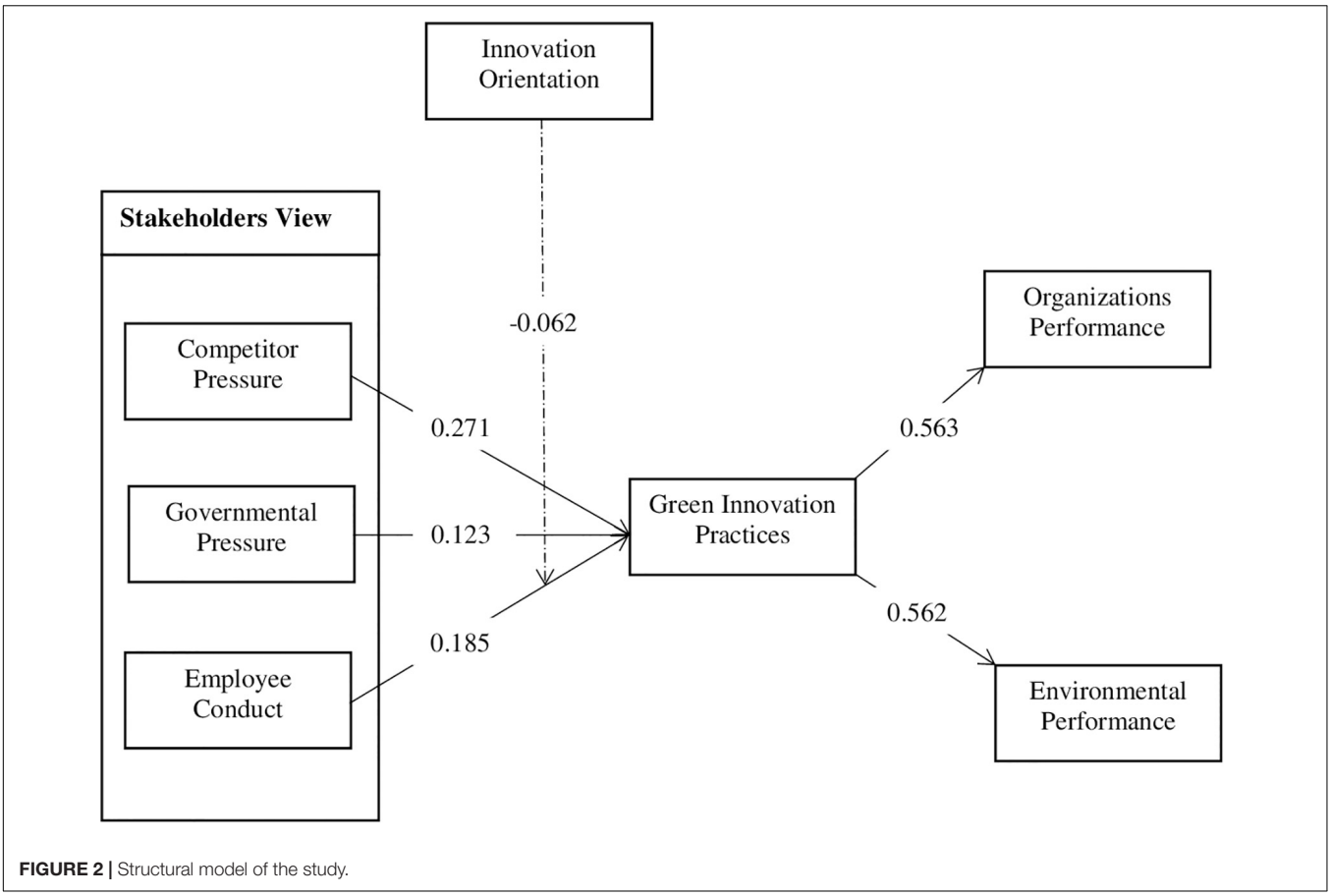

FIGURE 2 | Structural model of the study.

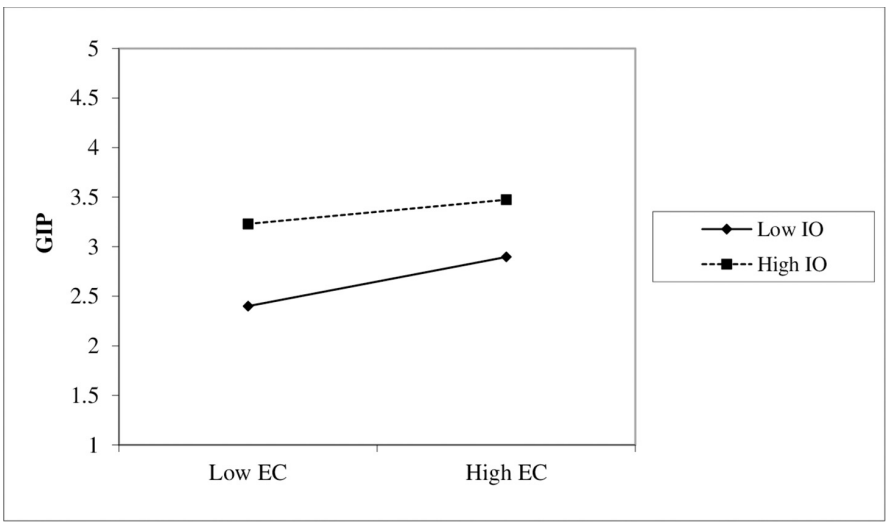

FIGURE 3 | Interaction graph EC × IO and GIP.

From the results, it is concluded that competitive pressure has a positive and significant impact on GI practices (Abrahamson and Rosenkopf, 1993; Cai and Li, 2018; Durand and Georgallis, 2018; Singh and El-Kassar, 2018; Yu, 2019) as well as that governmental pressure has a positive and significant impact on GI practices (Lindell and Karagozoglu, 2001; Bernauer et al., 2007; Zeng et al., 2011; Huang et al., 2016; Fernando and Wah, 2017; Yakubu, 2017; Famiyeh et al., 2018; He et al., 2018; Tirabeni et al., 2019; Zhang et al., 2019). Furthermore, it can be seen from our results that employee's conduct is positively

influenced by GI practices (Reinhardt, 1999; Daily and Huang, 2001; Zhu et al., 2008; Yen and Yen, 2012; Gholami et al., 2013; Cao and Chen, 2018; Tang et al., 2018; Soewarno et al., 2019). Also, our results conclude that GI practices have a positive and significant effect on OP (Berry and Rondinelli, 1998; Gounaris et al., 2003; Blazevic and Lievens, 2004; Chen, 2008a; de Burgos-Jiménez et al., 2013; Berrone et al., 2017; Zhang and Walton, 2017; Tang et al., 2018). The findings of the study suggest that GI practices positively related to environmental performance. From the findings, it is also concluded that the moderation effect of IO was found statistically significant but with a negative coefficient value. The study also describes significant implications and suggestions to the managers and policymakers.

Implications

The present study delivers numerous researches "contributions and managerial implications." First, this study presented that GI practices disturb not only EP but also OP. GI should be seen not only as responsive contentment of management requirements but as a pre-emptive exercise to advance a competitive advantage and the firm's performance (de Burgos-Jiménez et al., 2013). This pragmatic sign proposes that when organizations generously emphasize GI practices, they can promote both "financial and non-financial" performance. Top management executives can play a crucial role in carrying the significance of GI to all stakeholders. Second, both industrial and service organizations were investigated in the model. The data collected from both the sectors/industries showed no difference, and the results were the same. "Go green" is a significant issue for both divisions. GI practices need to be endlessly accepted in the product, process, marketing, management innovation, or all, regardless of industry. Finally, this study showed a statistically significant moderation effect of IO on EC concerning GI practices. However, we propose that the top management or executives accentuate innovation and inventiveness in their firm's culture. The effort to raise the constituents of innovation is critical to the existence and sustainability of firms.

LIMITATIONS AND FURTHER RESEARCH

Although this research study delivers valuable intuitions, some limitations should fuel further investigations. First, the study was conducted in Pakistan, which only included significant areas of the country; small cities were ignored in the research. Second, an executive's insights into GI practices and consequences are stranded in specific-industry norms. However, to focus on the conclusions' larger generalizability, we invite scholars to replicate our study but in diverse perspectives and countries. Future studies should include other dimensions of the stakeholders' view with the mediation of market innovation and management innovation. HR practices can also moderate the relationship between stakeholders' views and GI practices. Last, the mediation effects need to be explored further.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (APA). All participants gave written consent in accordance with the Declaration of Helsinki. The studies involving human participants were reviewed and approved by the Ethics Committee of the Lahore School of Business, University of Lahore, Pakistan. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MK, HW, and DA: the provision of materials (i.e., questionnaires) and principal manuscript writing. MM, FS, and FA: data collection and manuscript revision and proofreading. MK and HW: data analysis plan. FS and FA: data analysis. All authors contributed to definition of research objectives, models, and hypotheses and approved the final version of the manuscript.

REFERENCES

Abrahamson, E., and Rosenkopf, L. (1993). Institutional and competitive bandwagons: using mathematical modeling as a tool to explore innovation diffusion. *Acad. Manage. Rev.* 18, 487–517. doi: 10.5465/amr.1993.9309035148

Afridi, S. A., Afsar, B., Shahjehan, A., Khan, W., Rehman, Z. U., and Khan, M. A. S. (2020). Impact of corporate social responsibility attributions on employee's extra role behaviors: moderating role of ethical corporate identity and interpersonal trust. *Corpor. Soc. Responsib. Environ. Manage.* 2020, 1–14.

Albort-Morant, G., Leal-Millán, A., Cepeda-Carrion, G., and Henseler, J. (2018). Developing green innovation performance by fostering of organizational knowledge and coopetitive relations. *Rev. Manage. Sci.* 12, 499–517. doi: 10.1007/s11846-017-0270-z

Alrowwad, A. A., Obeidat, B. Y., Tarhini, A., and Aqqad, N. (2017). The impact of transformational leadership on organizational performance via the mediating role of corporate social responsibility: a structural equation modeling approach. *Int. Bus. Res.* 10, 199–221. doi: 10.5539/ibr.v10n1p199

Anderson, J. C., and Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychol. Bulletin* 103:411. doi: 10.1037/0033-2909.103.3.411

Arfi, W. B., Hikkerova, L., and Sahut, J.-M. (2018). External knowledge sources, green innovation and performance. *Technol. Forecasting Soc. Change* 129, 210–220. doi: 10.1016/j.techfore.2017.09.017

Atlin, C., and Gibson, R. (2017). Lasting regional gains from non-renewable resource extraction: the role of sustainability-based cumulative effects assessment and regional planning for mining development in canada. *Extr. Ind. Soc.* 4, 36–52. doi: 10.1016/j.exis.2017.01.005

Avlonitis, G. J., Papastathopoulou, P. G., and Gounaris, S. P. (2001). An empirically-based typology of product innovativeness for new financial services:

Success and failure scenarios. *J. Prod. Innovation Manage.* 18, 324–342. doi: 10.1111/1540-5885.1850324

Bagozzi, R. P., and Yi, Y. (1988). On the evaluation of structural equation models. *J. Acad. Marketing Sci.* 16, 74–94.

Bernauer, T., Engel, S., Kammerer, D., and Sejas Nogareda, J. (2007). Explaining green innovation: ten years after Porter's win-win proposition: how to study the effects of regulation on corporate environmental innovation? *Politisc. Vierteljahresschrift* 39, 323–341.

Berrone, P., Fosfuri, A., and Gelabert, L. (2017). Does greenwashing pay off? Understanding the relationship between environmental actions and environmental legitimacy. *J. Bus. Ethics* 144, 363–379. doi: 10.1007/s10551-015-2816-9

Berry, M. A., and Rondinelli, D. A. (1998). Proactive corporate environmental management: A new industrial revolution. *Acad. Manage. Perspect.*12, 38–50. doi: 10.5465/ame.1998.650515

Blazevic, V., and Lievens, A. (2004). Learning during the new financial service innovation process: antecedents and performance effects. *J. Bus. Res.* 57, 374–391. doi: 10.1016/s0148-2963(02)00272-2

Bryson, J. M. (2018). *Strategic planning for public and nonprofit organizations: A guide to strengthening and sustaining organizational achievement*. Hoboken, NJ: John Wiley & Sons.

Buysse, K., and Verbeke, A. (2003). Proactive environmental strategies: a stakeholder management perspective. *Strategic Manage. J.* 24, 453–470. doi: 10.1002/smj.299

Cai, W., and Li, G. (2018). The drivers of eco-innovation and its impact on performance: evidence from China. *J. Cleaner Prod.* 176, 110–118. doi: 10.1016/j.jclepro.2017.12.109

Cao, H., and Chen, Z. (2018). The driving effect of internal and external environment on green innovation strategy-The moderating role of top management's environmental awareness. *Nankai Bus. Rev. Int.* 10, 342–361. doi: 10.1108/nbri-05-2018-0028

Chan, H. K., He, H., and Wang, W. Y. (2012). Green marketing and its impact on supply chain management in industrial markets. *Ind. Marketing Manage.* 41, 557–562. doi: 10.1016/j.indmarman.2012.04.002

Chan, H.-L., Shen, B., and Cai, Y. (2018). Quick response strategy with cleaner technology in a supply chain: coordination and win-win situation analysis. *Int. J. Prod. Res.* 56, 3397–3408. doi: 10.1080/00207543.2016.1278283

Chang, C.-H. (2011). The influence of corporate environmental ethics on competitive advantage: the mediation role of green innovation. *J. Bus. Ethics* 104, 361–370. doi: 10.1007/s10551-011-0914-x

Chen, J.-S., Tsou, H.-T., and Ching, R. K. (2011). Co-production and its effects on service innovation. *Ind. Marketing Manage.* 40, 1331–1346. doi: 10.1016/j.indmarman.2011.03.001

Chen, Y.-S. (2008a). The driver of green innovation and green image–green core competence. *J. Bus. Ethics* 81, 531–543. doi: 10.1007/s10551-007-9522-1

Chen, Y.-S. (2008b). The positive effect of green intellectual capital on competitive advantages of firms. *J. Bus. Ethics* 77, 271–286. doi: 10.1007/s10551-006-9349-1

Chen, Y.-S., Lai, S.-B., and Wen, C.-T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *J. Bus. Ethics* 67, 331–339. doi: 10.1007/s10551-006-9025-5

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Mod. Methods Bus. Res.* 295, 295–336.

Chiou, T.-Y., Chan, H. K., Lettice, F., and Chung, S. H. (2011). The influence of greening the suppliers and green innovation on environmental performance and competitive advantage in taiwan. *Transp. Res. Part E Logist. Transp. Rev.* 47, 822–836. doi: 10.1016/j.tre.2011.05.016

Christmann, P. (2004). Multinational companies and the natural environment: determinants of global environmental policy. *Acad. Manage. J.* 47, 747–760. doi: 10.5465/20159616

Chu, Z., Wang, L., and Lai, F. (2019). Customer pressure and green innovations at third party logistics providers in china. *Int. J. Logist. Manage.* 30, 57–75. doi: 10.1108/ijlm-11-2017-0294

Clarkson, M. E. (1995). A stakeholder framework for analyzing and evaluating corporate social performance. *Acad. Manage. Rev.* 20, 92–117. doi: 10.5465/amr.1995.9503271994

Claver, E., Lopez, M. D., Molina, J. F., and Tarí, J. J. (2007). Environmental management and firm performance: a case study. *J. Environ. Manage.* 84, 606–619. doi: 10.1016/j.jenvman.2006.09.012

Co, H., and Barro, F. (2009). Stakeholder theory and dynamics in supply chain collaboration. *Int. J. Oper. Prod. Manage.* 29, 591–611. doi: 10.1108/01443570910957573

Cordano, M., Marshall, R. S., and Silverman, M. (2010). How do small and medium enterprises go "green"? A study of environmental management programs in the US wine industry. *J. Bus. Ethics* 92, 463–478. doi: 10.1007/s10551-009-0168-z

Crane, A., and Livesey, S. (2017). "Are you talking to me?: stakeholder communication and the risks and rewards of dialogue," in *Unfolding stakeholder thinking 2*, eds J. Andriof, S. Waddock, B. Husted, and S. S. Rahman (New York, NY: Routledge), 39–52. doi: 10.9774/gleaf.978-1-909493-32-2_4

Daily, B. F., and Huang, S.-C. (2001). Achieving sustainability through attention to human resource factors in environmental management. *Int. J. Oper. Prod. Manage.* 21, 1539–1552. doi: 10.1108/01443570110410892

de Burgos-Jiménez, J., Vázquez-Brust, D., Plaza-Úbeda, J. A., and Dijkshoorn, J. (2013). Environmental protection and financial performance: an empirical analysis in wales. *Int. J. Oper. Prod. Manage.* 33, 981–1018. doi: 10.1108/ijopm-11-2010-0374

De Giovanni, P. (2012). Do internal and external environmental management contribute to the triple bottom line? *Int. J. Oper. Prod. Manage.* 32, 265–290. doi: 10.1108/01443571211212574

Donaldson, T., and Preston, L. E. (1995). The stakeholder theory of the corporation: concepts, evidence, and implications. *Acad. Manage. Rev.* 20, 65–91. doi: 10.2307/258887

Durand, R., and Georgallis, P. (2018). Differential firm commitment to industries supported by social movement organizations. *Organ. Sci.* 29, 154–171. doi: 10.1287/orsc.2017.1170

El-Kassar, A.-N., and Singh, S. K. (2019). Green innovation and organizational performance: the influence of big data and the moderating role of management commitment and HR practices. *Technol. Forecast. Social Change* 144, 483–498. doi: 10.1016/j.techfore.2017.12.016

Famiyeh, S., Adaku, E., Amoako-Gyampah, K., Asante-Darko, D., and Amoatey, C. T. (2018). Environmental management practices, operational competitiveness and environmental performance: empirical evidence from a developing country. *J. Manuf. Technol. Manage.* 29, 588–607. doi: 10.1108/jmtm-06-2017-0124

Feng, L., Zhao, W., Li, H., and Song, Y. (2018). The effect of environmental orientation on green innovation: do political ties matter? *Sustainability* 10:4674. doi: 10.3390/su10124674

Feng, Z., and Chen, W. (2018). Environmental regulation, green innovation, and industrial green development: an empirical analysis based on the spatial durbin model. *Sustainability* 10:223. doi: 10.3390/su10010223

Fernando, Y., Jabbour, C. J. C., and Wah, W.-X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: Does service capability matter? *Resour. Conserv. Recyl.* 141, 8–20. doi: 10.1016/j.resconrec.2018.09.031

Fernando, Y., and Wah, W. X. (2017). The impact of eco-innovation drivers on environmental performance: empirical results from the green technology sector in malaysia. *Sustainable Prod. Consumption* 12, 27–43. doi: 10.1016/j.spc.2017.05.002

Foo, M. Y. (2018). *Green purchasing capabilities and practices towards triple bottom line performance: Moderating effects of institutional pressure*/.Foo Meow Yee.Phd Thesis. Kuala Lumpur: University of Malaya.

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Marketing Res.* 18, 39–50. doi: 10.2307/3151312

Freeman, E. (1984). Strategic Management. A Stakeholder Approach. *Stakehold. Manag. Framew. Phil.* 2, 267-299.

Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge: Cambridge university press.

Friedman, A. L., and Miles, S. (2006). *Stakeholders: Theory and practice*. Oxford: Oxford University Press.

Gao, Y., Tsai, S.-B., Xue, X., Ren, T., Du, X., Chen, Q., et al. (2018). An empirical study on green innovation efficiency in the green institutional environment. *Sustainability* 10:724. doi: 10.3390/su10030724

Gefen, D., Straub, D., and Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Comm. Assoc. Info. Sys.* 4:7.

Gholami, R., Sulaiman, A. B., Ramayah, T., and Molla, A. (2013). Senior managers' perception on green information systems (IS) adoption and environmental

performance: results from a field survey. *Inf. Manag.* 50, 431–438. doi: 10.1016/j.im.2013.01.004

Gluch, P., Gustafsson, M., and Thuvander, L. (2009). An absorptive capacity model for green innovation and performance in the construction industry. *Constr. Manage. Eco.* 27, 451–464. doi: 10.1080/01446190902896645

Gounaris, S. P., Papastathopoulou, P. G., and Avlonitis, G. J. (2003). Assessing the importance of the development activities for successful new services: does innovativeness matter? *Int. J. Bank Marketing* 21, 266–279. doi: 10.1108/02652320310488448

Hair, J. F., Anderson, R. E., Babin, B. J., and Black, W. C. (2010). *Multivariate data analysis: A global perspective (Vol. 7). In*. Upper Saddle River, NJ: Pearson.

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *J. Marketing Theory Prac.* 19, 139–152. doi: 10.2753/mtp1069-6679190202

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2013). Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance. *Long Range plan.* 46, 1–12. doi: 10.1016/j.lrp.2013.01.001

Hair, J. F., Sarstedt, M., Pieper, T. M., and Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications. *Long Range plan.* 45, 320–340. doi: 10.1016/j.lrp.2012.09.008

He, Z.-X., Shen, W.-X., Li, Q.-B., Xu, S.-C., Zhao, B., Long, R.-Y., et al. (2018).). Investigating external and internal pressures on corporate environmental behavior in papermaking enterprises of China. *J. Clean.Prod.* 172, 1193–1211. doi: 10.1016/j.jclepro.2017.10.115

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Market. Sci.* 43, 115–135. doi: 10.1007/s11747-014-0403-8

Hillestad, T., Xie, C., and Haugland, S. A. (2010). Innovative corporate social responsibility: the founder's role in creating a trustworthy corporate brand through "green innovation". *J. Prod. Brand Manage.* 19, 440–451. doi: 10.1108/10610421011085758

Hinton, P. R. (2014). *Statistics explained*. Abingdon: Routledge.

Ho, Y.-H., Lin, C.-Y., and Chiang, S.-H. (2009). Organizational determinants of green innovation implementation in the logistics industry. *Int. J. Organ. Innov.* 2, 3.

Huang, X.-x, Hu, Z.-p., Liu, C.-s., Yu, D.-j., and Yu, L.-f. (2016). The relationships between regulatory and customer pressure, green organizational responses, and green innovation performance. *J. Cleaner Prod.* 112, 3423–3433. doi: 10.1016/j.jclepro.2015.10.106

Huang, Y.-C., Ding, H.-B., and Kao, M.-R. (2009). Salient stakeholder voices: family business and green innovation adoption. *J. Manage.Organ.* 15, 309–326. doi: 10.5172/jmo.2009.15.3.309

Hurley, R. F., and Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *J. Marketing* 62, 42–54. doi: 10.1177/002224299806200303

Ilvitskaya, S., and Prihodko, V. (2018). Innovative technologies in the field of topography, land management, territorial planning, construction and architecture. *IOP Conf. Ser. Mater. Sci. Eng.* 365:022030. doi: 10.1088/1757-899x/365/2/022030

Jaaffar, A. H., and Amran, A. A. (2017). The influence of leaders' past environmental-related experiences and positive deviance behaviour in green management practices. *J. Pengurusan* 51, 1–18.

Jones, T. M., and Wicks, A. C. (1999). Convergent stakeholder theory. *Acad.Manage. Rev.* 24, 206–221. doi: 10.2307/259075

Kammerer, D. (2009). The effects of customer benefit and regulation on environmental product innovation.: empirical evidence from appliance manufacturers in germany. *Ecol. Eco.* 68, 2285–2295. doi: 10.1016/j.ecolecon.2009.02.016

Khan, M. A. S., Ali, M., Usman, M., Saleem, S., and Jianguo, D. (2019). Interrelationships between ethical leadership, green psychological climate, and organizational environmental citizenship behavior: the moderating role of gender. *Front. Psychol.* 10:1977. doi: 10.3389/fpsyg.2019.01977

Khan, M. A. S., Jianguo, D., Saleem, S., Boamah, K. B., Javed, U., and Usman, M. (2019). Rejuvenating the concept of work alienation through job demands-resources model and examining its relationship with emotional exhaustion and explorative and exploitative learning. *Psychol. Res Behav. Manage.* 12, 931. doi: 10.2147/prbm.s204193

Khan, S. A. R., and Qianli, D. (2017). Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan. *Environ. Sci. Pollu. Res.* 24, 16829–16844. doi: 10.1007/s11356-017-9172-5

Klassen, R. D., and Whybark, D. C. (1999). The impact of environmental technologies on manufacturing performance. *Acad. Manage. J.* 42, 599–615. doi: 10.5465/256982

Laplume, A. O., Sonpar, K., and Litz, R. A. (2008). Stakeholder theory: reviewing a theory that moves us. *J. Manage.* 34, 1152–1189. doi: 10.1177/0149206308324322

Lee, J. W., Kim, Y. M., and Kim, Y. E. (2018). Antecedents of adopting corporate environmental responsibility and green practices. *J. Bus. Ethics* 148, 397–409. doi: 10.1007/s10551-016-3024-y

Lin, C.-Y., and Ho, Y.-H. (2008). An empirical study on logistics service providers' intention to adopt green innovations. *J. Technol. Manage.Innov.* 3, 17–26.

Lin, C.-Y., and Ho, Y.-H. (2011). Determinants of green practice adoption for logistics companies in China. *J. Bus. Ethics* 98, 67–83. doi: 10.1007/s10551-010-0535-9

Lin, R.-J. (2013). Moderating effects of total quality environmental management on environmental performance. *Afr. J. Bus. Manag.* 5, 8088–8099. doi: 10.5897/AJBM10.1399

Lindell, M., and Karagozoglu, N. (2001). Corporate environmental behaviour–a comparison between nrdic and US firms. *Bus. Strategy Environ.* 10, 38–52. doi: 10.1002/1099-0836(200101/02)10:1<38::aid-bse269>3.0.co;2-c

López-Gamero, M. D., Claver-Cortés, E., and Molina-Azorín, J. F. (2008). Complementary resources and capabilities for an ethical and environmental management: a qual/quan study. *J. Bus. Ethics* 82, 701–732. doi: 10.1007/s10551-007-9587-x

Mitchell, R. K., Agle, B. R., and Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. *Acad. Manage. Rev.* 22, 853–886. doi: 10.2307/259247

Montabon, F., Sroufe, R., and Narasimhan, R. (2007). An examination of corporate reporting, environmental management practices and firm performance. *J. Oper. Manage.* 25, 998–1014. doi: 10.1016/j.jom.2006.10.003

Murillo-Luna, J. L., Garcés-Ayerbe, C., and Rivera-Torres, P. (2008). Why do patterns of environmental response differ? A stakeholders' pressure approach. *Strategic Manage. J.* 29, 1225–1240. doi: 10.1002/smj.711

Oke, A. (2007). Innovation types and innovation management practices in service companies. *Int. J. Oper. Prod. Manage.* 27, 564–587. doi: 10.1108/01443570710750268

Porter, M. E., and Kramer, M. R. (2019). *Creating shared value. In Managing sustainable business*. New York, NY.: Springer, 323–346.

Qi, G., Shen, L., Zeng, S., and Jorge, O. J. (2010). The drivers for contractors' green innovation: an industry perspective. *J. Cleaner Prod.* 18, 1358–1365. doi: 10.1016/j.jclepro.2010.04.017

Ramus, C. A. (2018). *Employee environmental innovation in firms: Organizational and managerial factors*. Abingdon: Routledge.

Reinhardt, F. L. (1999). Bringing the environment down to earth. *Harvard Bus. Rev.* 77, 149–149.

Rennings, K. (2000). Redefining innovation—eco-innovation research and the contribution from ecological economics. *Ecol. Eco.* 32, 319–332. doi: 10.1016/s0921-8009(99)00112-3

Rusinko, C. (2007). Green manufacturing: an evaluation of environmentally sustainable manufacturing practices and their impact on competitive outcomes. *IEEE Trans. Eng. Manage.* 54, 445–454. doi: 10.1109/tem.2007.900806

Saeed, A., Jun, Y., Nubuor, S., Priyankara, H., and Jayasuriya, M. (2018). Institutional pressures, green supply chain management practices on environmental and economic performance: a two theory view. *Sustainability* 10, 1517. doi: 10.3390/su10051517

Salem, M. A., Shawtari, F., Shamsudin, M. F., and Hussain, H. B. I. (2018). The consequences of integrating stakeholder engagement in sustainable development (environmental perspectives). *Sustainable Dev.* 26, 255–268. doi: 10.1002/sd.1699

Sarkis, J., and Cordeiro, J. J. (2001). An empirical evaluation of environmental efficiencies and firm performance: pollution prevention versus end-of-pipe practice. *European J. Oper. Res.* 135, 102–113. doi: 10.1016/s0377-2217(00)00306-4

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Saman, M. Z. M., Hooker, R. E., et al. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *J. Cleaner Prod.* 229, 115–127. doi: 10.1016/j.jclepro.2019.03.211

Seman, N. A. A., Zakuan, N., Rashid, U. K., Nasuredin, J., and Ahmad, N. (2018). Understanding Stakeholder Pressures in Adopting Environmental Management Practices Based on Stakeholder Theory: A Review. *Int. J. Res.* 05, 1530–1545.

Sezen, B., and Çankaya, S. Y. (2013). Effects of green manufacturing and eco-innovation on sustainability performance. *Procedia Soc. Behav. Sci.* 99, 154–163. doi: 10.1016/j.sbspro.2013.10.481

Shahzad, F., Du, J., Khan, I., Shahbaz, M., Murad, M., and Khan, M. S. S. (2020). Untangling the influence of organizational compatibility on green supply chain management efforts to boost organizational performance through information technology capabilities. *J. Cleaner Prod.* 266, 1–13.

Shahzad, M., Qu, Y., Javed, S. A., Zafar, A. U., and Rehman, S. U. (2020). Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry. *J. Cleaner Prod.* 253, 119938. doi: 10.1016/j.jclepro.2019.119938

Siguaw, J. A., Simpson, P. M., and Enz, C. A. (2006). Conceptualizing innovation orientation: A framework for study and integration of innovation research. *J. Prod.Innov. Manage.* 23, 556–574. doi: 10.1111/j.1540-5885.2006.00224.x

Singh, S. K., and El-Kassar, A.-N. (2018). Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices. *Technol. Forecast. Social Change* 144, 483–498.

Soewarno, N., Tjahjadi, B., and Fithrianti, F. (2019). Green innovation strategy and green innovation: the roles of green organizational identity and environmental organizational legitimacy. *Manage. Decis.* 57, 3061–3078. doi: 10.1108/md-05-2018-0563

Song, M., Yang, M. X., Zeng, K. J., and Feng, W. (2020)). Green knowledge sharing, stakeholder pressure, absorptive capacity, and green innovation: Evidence from Chinese manufacturing firms. *Bus. Strategy Environ.* 29, 1517–1531. doi: 10.1002/bse.2450

Song, W., and Yu, H. (2018). Green innovation strategy and green innovation: The roles of green creativity and green organizational identity. *Corporate Social Responsibility Environ.Manage.* 25, 135–150. doi: 10.1002/csr.1445

Stock, R. M., and Zacharias, N. A. (2011). Patterns and performance outcomes of innovation orientation. *J. Acad. Marketing Sci.* 39, 870–888. doi: 10.1007/s11747-010-0225-2

Sulkowski, A. J., Edwards, M., and Freeman, R. E. (2018). Shake your stakeholder: Firms leading engagement to cocreate sustainable value. *Organ. Environ.* 31, 223–241. doi: 10.1177/1086026617722129

Tang, M., Walsh, G., Lerner, D., Fitza, M. A., and Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Bus. Strategy Environ.* 27, 39–51. doi: 10.1002/bse.1981

Tirabeni, L., De Bernardi, P., Forliano, C., and Franco, M. (2019). How can organisations and business models lead to a more sustainable society? A framework from a systematic review of the industry 4.0. *Sustainability* 11:6363. doi: 10.3390/su11226363

Ullah, M. (2017). Integrating environmental sustainability into human resource management: a comprehensive review on green human resource management. *Maghreb Rev. Eco. Manage.* 423, 1–17. doi: 10.4324/9781315768953-1

Umrani, W. A., Kura, K. M., and Ahmed, U. (2018). Corporate entrepreneurship and business performance: the moderating role of organizational culture in selected banks in pakistan. *PSU Res. Rev.* 2, 59–80. doi: 10.1108/prr-12-2016-0011

Venkatraman, N., and Ramanujam, V. (1986). Measurement of business performance in strategy research: a comparison of approaches. *Acad. Manage. Rev.* 11, 801–814. doi: 10.2307/258398

Wagner, M. (2007). On the relationship between environmental management, environmental innovation and patenting: evidence from german manufacturing firms. *Res. Policy* 36, 1587–1602. doi: 10.1016/j.respol.2007.08.004

Wang, S.-H., and Song, M.-L. (2014). Review of hidden carbon emissions, trade, and labor income share in china, 2001–2011. *Energy Policy* 74, 395–405. doi: 10.1016/j.enpol.2014.08.038

Weng, H.-H. R., Chen, J.-S., and Chen, P.-C. (2015). Effects of green innovation on environmental and corporate performance: a stakeholder perspective. *Sustainability* 7, 4997–5026. doi: 10.3390/su7054997

Xie, X., Huo, J., and Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: a content analysis method. *J. Bus. Res.* 101, 697–706. doi: 10.1016/j.jbusres.2019.01.010

Xie, X., Zhu, Q., and Wang, R. (2019). Turning green subsidies into sustainability: how green process innovation improves firms' green image. *Bus. Strategy Environ.* 28, 1416–1433. doi: 10.1002/bse.2323

Yakubu, O. (2017). Addressing environmental health problems in ogoniland through implementation of united nations environment program recommendations: environmental management strategies. *Environments* 4:28. doi: 10.3390/environments4020028

Yen, Y.-X., and Yen, S.-Y. (2012). Top-management's role in adopting green purchasing standards in high-tech industrial firms. *J. Bus. Res.* 65, 951–959. doi: 10.1016/j.jbusres.2011.05.002

Yu, M. (2019). Impact of environmental regulation on green innovation practice of food enterprises: regulating effect of environmental awareness of different executives. *Rev. Facult. Agr. Univ. Zulia* 36, 149696095.

Zeng, S., Meng, X., Zeng, R., Tam, C. M., Tam, V. W., and Jin, T. (2011). How environmental management driving forces affect environmental and economic performance of SMEs: a study in the northern china district. *J. Cleaner Prod.* 19, 1426–1437. doi: 10.1016/j.jclepro.2011.05.002

Zhang, H., He, J., Shi, X., Hong, Q., Bao, J., and Xue, S. (2020). Technology characteristics, stakeholder pressure, social influence, and green innovation: empirical evidence from chinese express companies. *Sustainability* 12;2891. doi: 10.3390/su12072891

Zhang, J. A., and Walton, S. (2017). Eco-innovation and business performance: the moderating effects of environmental orientation and resource commitment in green-oriented SME s. *R&d Manage.* 47, E26–E39.

Zhang, J., Zhang, X., Wang, Q., and Ma, Z. (2019). "Relationship Between Institutional Pressures, Green Supply Chain Management Practices and Business Performance: An Empirical Research on Automobile Industry," in *Paper presented at the International Conference on Management Science and Engineering Management*. San Francisco: ICMSEM.

Zhou, K. Z., Gao, G. Y., Yang, Z., and Zhou, N. (2005). Developing strategic orientation in china: antecedents and consequences of market and innovation orientations. *J. Bus. Res.* 58, 1049–1058. doi: 10.1016/j.jbusres.2004.02.003

Zhu, Q., and Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in chinese manufacturing enterprises. *J. Oper. Manage.* 22, 265–289. doi: 10.1016/j.jom.2004.01.005

Zhu, Q., Feng, Y., and Choi, S.-B. (2017). The role of customer relational governance in environmental and economic performance improvement through green supply chain management. *J. Cleaner Prod.* 155, 46–53. doi: 10.1016/j.jclepro.2016.02.124

Zhu, Q., Geng, Y., Fujita, T., and Hashimoto, S. (2010). Green supply chain management in leading manufacturers: case studies in japanese large companies. *Manage. Res. Rev.* 33, 380–392. doi: 10.1108/01409171011030471

Zhu, Q., Sarkis, J., Cordeiro, J. J., and Lai, K.-H. (2008). Firm-level correlates of emergent green supply chain management practices in the chinese context. *Omega* 36, 577–591.

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ANNEXURE

Descriptive statistics.

Items	Mean	Median	Min	Max	SD	Excess Kurtosis	Skewness
OP1	3.737	4	1	5	0.799	0.195	−0.319
OP2	4.171	4	2	5	0.835	−0.192	−0.731
OP3	4.029	4	2	5	0.837	−0.456	−0.494
OP4	4.05	4	2	5	0.794	−0.629	−0.371
OP5	3.775	4	1	5	0.914	0.086	−0.581
OP6	3.99	4	1	5	0.906	−0.45	−0.499
OP7	4.031	4	1	5	0.883	−0.131	−0.621
OP8	2.324	3	1	5	0.722	−0.192	−0.571
GP1	4.072	4	1	5	0.935	−0.158	−0.729
GP2	3.897	4	1	5	1.01	0.207	−0.756
GP3	3.763	4	1	5	0.998	−1.054	−0.193
GP4	4.004	4	1	5	0.929	−0.666	−0.519
EP1	3.802	4	1	5	1.033	−0.005	−0.687
EP2	3.981	4	1	5	0.997	0.239	−0.869
EP3	4.023	4	1	5	0.918	0.721	−0.863
EP4	3.353	3	1	5	1.139	−0.4	−0.407
EP5	3.821	4	1	5	0.821	−0.213	−0.731
EP6	4.721	4	1	5	0.945	−0.172	−0.261
CP1	3.82	4	1	5	0.864	0.582	−0.624
CP2	3.946	4	1	5	0.893	−0.184	−0.484
CP3	3.697	4	1	5	0.9	−0.304	−0.441
CP4	4.014	4	1	5	0.936	0.298	−0.783
IO1	3.928	4	1	5	0.986	1.148	−1.064
IO2	2.92	3	1	5	1.339	−1.155	0.01
IO3	2.792	3	1	5	1.311	−1.253	−0.001
IO4	3.779	4	1	5	1.117	−0.232	−0.745
IO5	3.975	4	1	5	0.962	−0.404	−0.632
IO6	4.002	4	1	5	1.032	0.339	−0.938
IO7	3.272	3	1	5	1.134	−0.467	−0.508
EC1	3.831	4	2	5	0.771	−0.518	−0.133
EC2	3.817	4	2	5	0.736	−0.042	−0.314
EC3	3.802	4	1	5	0.868	0.322	−0.535
EC4	3.852	4	2	5	0.869	−0.687	−0.28
GIP1	3.579	4	1	5	1.037	0.453	−0.819
GIP2	3.371	4	1	5	1.267	−0.688	−0.579
GIP3	3.495	4	1	5	0.929	0.267	−0.597
GIP4	3.338	4	1	5	1.105	−0.335	−0.568
GIP5	3.621	4	1	5	0.915	0.767	−0.796
GIP6	4.068	4	2	5	0.884	−0.226	−0.708
GIP7	3.252	3	1	5	1.064	−0.507	−0.216
GIP8	3.724	4	1	5	0.869	0.944	−0.699
GIP9	3.864	4	1	5	0.871	0.459	−0.636

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