The Mediated Effect of Bounded Rationality on the Relationship between National Cultural Psychology and Irrationality in Financial Decision Making of Entrepreneurs: An empirical study on the evidence from Ethnic Minority Business (EMBs) Entrepreneurs in West Midlands, UK.

Rodrigo L.S[1*], Guo Y.[2], Zhu Xiaoxian [3]

Teesside University, United Kingdom[1,2,3]

L.Rodrigo@tees.ac.uk[1], Y.Guo@tees.ac.uk[2], X.Zhu@tees.ac.uk[3]

ABSTRACT

Entrepreneurs' irrational financial decision making behaviour is presumably triggered by the combined effect of their cultural and cognitive factors. However, these factors and their influences on entrepreneurial behaviour are remained under-researched to date. Therefore, this paper for first time aims to explain how entrepreneurs deviate from rationality when making crucial financial decisions based on empirical evidence gathered from ethnic minority business (EMBs) entrepreneurs (Sri Lankan) in the UK. A questionnaire consisting five point Likert scaled questions was used to collect data. Based on Kline's (2005) 10:1 rule of thumb sampling method, two hundred (200) Sri Lankan entrepreneurs in the UK were selected. Structural Equation Modelling (SEM), Exploratory and Confirmatory Factor Analyses (EFA and CFA) were used to examine the tripartite relationship among the underlying constructs. EFA results show the associations among National Cultural Psychology (NCP), Bounded Rationality (BR) and Irrationality in Financial Decision Making (IFDM). CFA further proved a statistically significant direct effect in between NCP and IFDM (standardised estimation =0.403, p=0.002<0.05), and Indirect effect via BR (standardised estimation = 0.301, p=0.001<0.05) simultaneously. Accordingly, it can be interestingly discovered a 'Partial Mediation' among these three constructs.

This study offers a new knowledge for entrepreneurship literature examining the entrepreneurial behaviour through the lens of national culture and cognitive biases of entrepreneurs for first time. The paper introduces a novel theoretical model named as 'The mediation effect theory of cultural and behavioural finance in Financial Decision Making' which explains how national cultural and cognitive factors divert entrepreneurs from the rationality when making crucial financial decisions. For the first time, this paper provides strong empirical evidence how entrepreneurial behaviour is influenced by national cultural attributes and cognitive biases simultaneously. This research further bridges entrepreneurship with the cultural finance discipline which is an emerging field under the umbrella of behavioural finance. Entrepreneurs and authorities are recommended to consider cultural attributes that trigger cognitive biases and eventually, divert from rational decision-making.

Keywords: Entrepreneurial Behaviour, National Cultural Psychology, Cognitive Biases, Bounded Rationality, Irrationality in Financial Decision Making.

INTRODUCTION

In 2021, there were 5.5 million private businesses in the UK and 99.3% of them were SMEs with less than 50 employees (Department for Business, Energy and Industrial Strategy, 2021). As a highly culturally diverse country, UK's SMEs are owned by different entrepreneurs who came from different ethnic and cultural backgrounds. These minority-led small business firms are commonly known as Ethnic Minority Businesses (EMBs). According to Ram et al. (2002), EMBs are defined as a subset of SMEs which is 51% owned and operated by ethnic minority people in a particular country. EMBs have become a trendy research area during the last couple of decades. Researchers have highly focused on topics such as challenges faced by EMBs, accessing finance for EMBs and the ways of empowering EMBs (Ullah et al., 2017; Ram et al., 2008). The UK authorities such as the Federation of Small Businesses (FSB), and Enterprises Research Centre (ERC) are also interested in researching EMBs considering them as a part of UK economy. However, FSB (2020) found that EMBs are detached from mainstream business support while ERC (2015) revealing that EMBs are encountering higher survival threats compared to their white SMEs counterparts. British Business Bank (2020) stated that EMBs are experiencing comparatively low success rate & worse business outcomes than their white counterparts. After Covid-19, Black and Asian Minority Ethnic (BAME) are believed comparatively highly struggling (British Business Bank, 2020). In other words, the magnitude of Covid-19 economic impact is also higher on EMBs. Even though United Kingdom can be considered as a country where all businesses have equal rights and no discriminations against any ethnicity or nationality, this underperformance of ethnic minority entrepreneurs is questionable.

Department for Communities and Local Government (2013) stated that mainstream financial support services in the UK are struggling when catering their services to ethnic minority businesses due to their lack of cultural sensitivity and knowledge towards ethnic minorities. This finding implies that Ethnic minority entrepreneurs represent unique cultural backgrounds differed from other non-EMB counterparts in the UK. Even though the issues encountered by EMBs have extensively been researched by both academics and government authorities, the entrepreneurial behavior of ethnic minority entrepreneurs and how it is shaped by their cultural and cognitive factors have been less researched. In other words, there is a shortcoming in the related literature those studied the Cultural Finance and Financial psychology in the context of ethnic minority entrepreneurs in the UK. There is a deficiency in entrepreneurship literature that focuses on cultural, cognitive and behavioural factors of ethnic minority entrepreneurs.

Research Problem Statement

As emphasized in the previous section, ethnic minority business entrepreneurs (EMBs) are likely more struggling when running their businesses compared to white counterparts. Even though scholars had conducted many studies to identify the causes (ex: lack of access to finance, poor financial literacy, lack of support from authorities etc) behind this potential issue, they have not sufficiently focused on cultural and behavioural aspects of ethnic minority business entrepreneurs and their influence on entrepreneurial decisions. Accordingly, this paper attempts to answer the question of '*whether EMB entrepreneurs irrational financial decisions are triggered by their cultural and behavioural attributes*?'

Research purpose

Aligning with the research question, the main aim of this research is to scrutinize the financial decision making irrationalities of ethnic minority entrepreneurs triggered by their cultural and behavioural attributes.

Research Objectives

- o   To identity cultural and behavioural attributes embodied within the ethnic minority entrepreneurs
- o   To understand irrational financial decision making behaviour of ethnic minority entrepreneurs
- o   To examine the nature of relationship existing among cultural, behavioural and irrational financial decision making of ethnic minority entrepreneurs

LITERATURE REVIEW

National Culture

National Culture is defined by House et al., (2004) as shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experience of members of collectives that are transmitted across generations. Hofstede (1991) explains that culture is "the collective programming of mind that distinguishes the people of one country, region or group from people of other countries, regions or groups". Even though these theories have been widely used to compare national cultural values rooted within different people in different societies, they have less used to explain how they impact on financial psychology of entrepreneurs. House et al., (2004) GLOBE cultural theory develops comprehensive, more theoretical, updated and verifiable cross-cultural dimensions.

Especially this model extends and links national culture with leadership and their Culturally-endorsed implicit Leadership Theories (CLT) explain the individual leadership and entrepreneurship in terms of their national cultural backgrounds. Therefore, GLOBE model provides an effective framework to examine the entrepreneurship through the lens of national culture (Stephan and Pathak, 2016; House et al., 2004). Appendix 01 provides definitions for four types of National Cultural Dimensions those are commonly found in both House's (2004) GLOBE model and Hofstede's (2001) cultural dimensions. Those variables will be recognized as the indicators of the latent variable of 'National Cultural Psychology'

Behavioural Finance, Bounded Rationality and Cognitive Biases

Thaler (1999) stated that behavioural finance is an integration of classical economics and financial theories within studies investigating psychology and decision making. Behavioural finance is the study which explain reasoning patterns of investors, including the emotional processes involved and the degree to which they influence the decision-making process. According to Ricciardi and Simon (2000), Behavioural Finance is a composition of Psychology, Sociology and Finance. Kahneman and Tversky (2000) as pioneers of behavioural finance stated that financial decision making is highly impacted by decision makers' psychological factors, and it finally deviates them from the rationality. In line with this, Bosa and Sunita (2018) highlighted that behavioural finance explained the causes for the irrational decision of investors while focusing on the investors' behavioural bias which influences their decision-making process. However, the core idea of behavioural finance contradicts with conventional financial theories suggesting that decisions are rationally taken by investors after evaluating the available information and theoretical considerations. In other words, this emerging finance management discipline questions traditional financial management theories (ex: Pecking order theory, EMH, CAPM) since it argues that decision-makers are not often rational and not making decisions based on information and logical reasoning.

Bounded Rationality and Cognitive Biases are key terms found under the behavioural finance literature. The term of Bounded Rationality was introduced to the economics by Simon (1997) as a result of his research on organizational decision making. As suggested by Marciano and Ramello (2014), Bounded Rationality (BR) means that when individuals make decisions, they are "bounded" or limited because of inadequate information, time constraints and cognitive

limitations inherent in the human mind. The last reason among these three is directly linked with cognitive biases. In other terms, cognitive biases may cause on the bounded rationality of decision makers. However, bounded rationality and other concepts in behavioural finance have been widely used to study the stock market investors' decision-making behaviours and less focus on small business entrepreneurs.

Kahneman (2011) emphasised that behavioural biases have a profound impact on decision-making and can drive suboptimal decision making and errors that directly contradict with traditional finance. In the meantime, Simon (1997) suggests that cognitive biases influence on the bounded rationality of entrepreneurs. Combining these two arguments, it can be conceptualised that bounded rationality triggered by cognitive biases finally determine the rationality in decision making. Therefore, cognitive biases can be considered as indicators of bounded rationality. Appendix 02 provides definitions for five types of Cognitive Biases (Kahneman, 2002, 2011) which are the indicators of the latent variable known as 'Bounded Rationality' (Marciano and Ramello, 2014).

Irrationality in Financial Decision Making

Compared to other large companies, financial decision making is highly crucial for small business entrepreneurs since they have less resources and one irrational decision can collapse the entire business. Even though conventional financial theories such as pecking order theory, EMH, trade off theory assume that entrepreneurs take rational decisions, it is questionable that entrepreneurs do often take rational decisions as emphasised by above traditional theories (Ackert, 2014). Barberis and Thaler (2003) argued that behavioural finance is a relatively modern financial subject, seeks to summarize the combination of behaviour and cognitive factors that influences irrational financial decisions. It is also based on the exceptional idea that the majority or at least a significant minority of investors are influenced by their behavioural biases, which leads to less rational or fully irrational decision-making (Rasool and Ullah, 2019). Modern finance perspective indicated that investors do not always act irrationally, and they contribute their funds by examining the risk and reward and face a lot of psychological and sentiment biases (Kahneman and Tversky, 2013). However, the irrationality in financial decision making has been mostly researched focusing on the stock market investors and it creates a gap in literature those focused on EMB entrepreneurs. Appendix 03 provides definitions for three types of Financial Management Decisions (Ogilvie, 2006) which are the

indicators of the latent variable known as 'Irrationality in Financial Decision Making'. This study applies these three types in EMB entrepreneur and develops six questions in the Section 03 of the questionnaire. Because each type of financial decision is constructed by two themes. For example: Investment Decision is subdivided into Long Term (Capital Budgeting) and Short Term (Working Capital Management) decisions.

Potential Research Gaps

Prior studies have significantly suggested the impact of national culture on firm-level financial policies (Chang et al., 2012). However, the impact of these cultural and cognitive factors on the irrationality in financial decisions making has been less researched. Inadequate causal explanations for financial decision-making behaviours and cognitive biases of entrepreneurs are major shortcomings in these studies. It is seemed that former researchers have less focussed on interrelationship between national culture and cognitive factors behind the financial decision making. In other words, direct and indirect effects existing among these three paradigms have not been studied. In order to address this potential literature gap, this paper's main question designs to examine *'The tripartite relationship existing amongst National Culture, Behavioural Finance and Financial Decision Making of Sri Lankan South Asian Entrepreneurs in the UK'.*
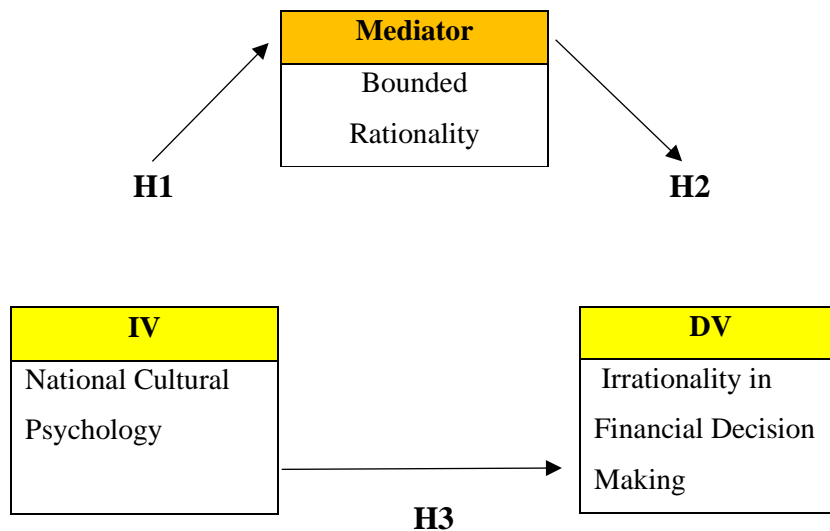

Figure 6: The coeptual framework

Figure 01 conceptualises the tripartite relationship to be tested in this paper. Accordingly, it can be summarised the hypotheses as follows,

H1: There is a relationship between National Culture Psychology (NCP and Bounded Rationality (BR)

H2: There is a relationship between Bonded Rationality (BR) and Irrationality in Financial Decision Making (IFDM)

H3: There is a relationship between National Cultural Psychology and Irrationality in Financial Decision Making

H4 – There is a mediating effect of Bounded Rationality on the relationship between National Cultural Psychology and Irrationality in Financial Decision Making.

These questions were designed based on national cultural dimensions identified by GLOBE researchers (House et. al., 2004). Second section of questionnaire consists of 5 questions and this section captures five different cognitive biases explained by Kahneman and Tversky (2013). Final section measures the irrationality in financial decision making by asking 6 questions those indirectly discover the irrationalities involved when taking three types of financial decisions explained by Ogilvie (2009).

METHODOLOGY

Research Design

This research's reality can be explained by using Gidden's (2013) structuration theory. EMB entrepreneurs can be considered as 'agents' and their agency of decision making is determined by 'culturally driven social structures'. In other words, entrepreneurs do not take rational decisions all the time due to the invisible influence of cultural and psychological drivers lead them to divert from the rationality. This research is entirely based on primary data that was collected by survey method. This research examines the entrepreneurial behaviour using a questionnaire (Likert Scaled). A structured questionnaire (Appendix 4) is developed and used to collect required primary data. The structured questionnaire consist of three parts. First section includes four questions measuring the national cultural psychology construct. Second (5 questions) and third (six questions) sections respectively measures the Bounded Rationality and Irrationality in Financial decision Making variables. Each of these questions were operationalised based on the previous literature (Appendix 05).

Data Collection

These psychological constructs are invisible, intangible and unconscious since they are embedded within the mindset of decision makers. Therefore, measuring these psychological latent factors and unearthing these underlying cognitive drivers are challenging in nature. This study selects measuring variables or indicators from well-established theories that have capabilities to represent the latent or underling factors to be researched. Unfortunately, there is no consensus in the literature regarding what would be the appropriate sample size for SEM. However, minimum sample sizes for factor analysis models range from 30 to 460 cases, depending on the number of factors (1-3), the number of indicators per factor (3-8), the average correlation between indicators and factors (.50 -.80), the magnitude of factor correlations (.30-.50) and the extent of missing data (2-20% per indicator) (Kline 2015, p.16). A widely accepted rule of thumb is 10 cases/observations per indicator variable (10:1) in setting a lower bound of an adequate sample size. And also, Hair et. Al. (2010) also emphasized that a sample size of at least 100 to achieve reliable findings while Shah and Goldstein (2006) state that the general rule considers a sample size of 100 to 200 as a 'good sample size'. Considering all above facts, this research adopted rule of thumb sampling frame to determine the sample size. According to above SEM path diagram, this research involves three (3) main constructs and expected to maintain a communality above 0.5. Accordingly, this research's sample size is calculated as follows,

Number of indicators in the SEM model proposed	- 20
Expected number of cases/ observation per parameter	- 10
Therefore, the Sample Size	- 20 x 10 - **200**

The researcher has ensured the accessibility for 200 ethnic minority businesses through the client's database of an accounting firm which mainly caters services for Sri Lankan ethnic minority businesses in the UK.

Factor analysis

As discussed earlier, this paper mainly involves underlying psychological constructs those are required to be studied by using psychometric scales and procedures. Therefore, it is essential to have a powerful analytical technique which can analyse complex psychological responses in decision-making. Here, Factor analysis is identified as the most suitable analytical technique

for this paper since it allows researchers to explains the variability of observed variables (Indicators) and unobserved variables (Latent factors) and relationships existing among unobserved variables each other. This analytical method has been used by researchers when developing theories adopted in this research. This method has been frequently used by researchers in similar research contexts (Rasool and Ullah, 2019; Lin, 2011). The two main branches of factor analysis known as exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Swanson and Holton, 2005) are to be used for this study. The purpose of using EFA is that its capability to explore the underlying (latent) factors by grouping indicators (measuring variables) with similar patterns or attributes. By using the CFA, researchers expect to test hypothesised relationships among latent constructs each other and carry out a causal study. The outputs of this CFA finally use to perform a mediation analysis considering the nature of direct and indirect effects of latent factors each other. After carrying out CFA, it will be carried out a model fit analysis using recommended measurements for SEM (Absolute Fit, Incremental and Parsimonious Fit). However, Reliability of the EFA and CFA are respectively measured using Cronbach's alpha and Composite Reliability tests (Brown, 2015). By conducting these reliability tests, the Internal consistency[7] of the model can be assured. Under EFA, Cronbach's alpha determines how consistent the responses are across items within the scale (Stewart et al, 2017). Composite reliability measures the internal reliability of all the variables in their measurement of a construct. Based on the standardised regression weights generated from SPSS Amos, the composite reliability (CR) of each three measurement models can be calculated using standardised loadings and measurement errors.

$$\text{Composite Reliability (CR)} = \frac{(\sum \text{Standardized Loading})^2}{(\sum \text{Standardized Loading})^2 + (\sum \text{Measurement Error})^2}$$

$$\text{Measurement Error (ME)} = 1 - (\sum \text{Standardized Loading})^2$$

The validity of the model to be tested by calculating the average variance extracted (AVE). AVE determines the amount of variance of the measured indicators captured by the latent construct. Bagozzi and Yi (1988) suggested 0.60 and 0.50 as the minimum value of composite reliability and average variance extracted, respectively. In addition, the Validity of the model

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[7] Internal Consistency – Internal Consistency Reliability is a way to gauge how well a test or survey is actually measuring what researcher wants it to measure.

will be tested using two main validity tests known as Convergent validity and Discriminant validity (Brown, 2015). Convergent validity refers to the extent to which the measured variables of a specific factor have a high proportion of variance in common and assess the same factor. This value can be generated by calculating the average variance extracted (AVE). Discriminant validity provides evidence that a construct is truly distinct from other constructs (Hair et. al, 2010) and captures the phenomena and concepts that other constructs do not.

$$\text{Convergent Validity} \quad = \quad \frac{\sum (\text{Standardized Loading}^2)}{\text{Number of Indicators}} \quad = \text{AVE}$$

$$\text{Discriminant Validity} \quad = \quad \text{Square Root of AVE}$$

DATA ANALYSIS

Factor analysis is used in analysing the data involving psychological underlying factors those are hard to measure in nature. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are employed to deeply inspect the relationship existing among indicators and latent factors. All the statistical outputs were generated using SPSS 26 and SPSS AMOS software.

Exploratory Factor Analysis (EFA)

EFA is used to identify underlying factors and patterns of similar responses.

Table 25: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling		0.907
Bartlett's Test of Sphericity	Approx. Chi-Square	1382.894
	Df	91
	Sig.	0.000

KMO statistic measures whether responses given for this sample is adequate to perform a factor analysis at a satisfactory level. Above table I shows that KMO statistic for this data set is 0.907 and it is closer to the value of 1. Therefore, this paper's sampling adequacy or sample size is acceptable. Bartlett's Test of Sphericity is used to evaluate whether a correlation matrix is suitable for factor analysis by testing the hypothesis that the matrix is an identity matrix (a matrix in which all coefficients not in the diagonal are zeroes).

Table 1 found that Bartlett's test of sphericity statistics is 0.000 (p<0.05) and therefore, it reveals that the correlation matrix is not an identical matrix. Accordingly, it can be assumed that successive data reduction technique (factor analysis) compresses the data in a meaningful way. In other words, this data set is appropriate to perform a factor analysis.

Table 26: Communalities

Indicator	Initial	Extraction
UA (Uncertainty Avoidance)	1.000	0.722
PD (Power Distance)	1.000	0.665
CI (Collectivism)	1.000	0.711
FO (Future Orientation)	1.000	0.650
O (Overconfidence)	1.000	0.743
HM (Herd Mentality)	1.000	0.590
LS (Loss Aversion)	1.000	0.617
Anchoring (A)	1.000	0.638
CS (Capital Structure)	1.000	0.668
CC (Cost of Capital)	1.000	0.656
IA (Investment Appraisal)	1.000	0.697
WC (Working Capital)	1.000	0.581
PR (Profit Retention)	1.000	0.542
DP (Dividend Policy)	1.000	0.573

Extraction Method: Principal Component Analysis

Table 2 demonstrates the communalities of each variable and it explains how much of the variance of different variables has been accounted for or contributed by the extracted factors. In other words, an item communality (IC) is the % of item variance explained by the extracted factors. The variables with below 0.5 communalities are not to be considered for further analysis due to their incapability to explain the variance of factors at satisfactory level. Accordingly, due to the lower communality value (0.391) of Heuristics in Judgement (HJ) variable was excluded from the factor analysis. A factor loading greater than 0.4 is said to be sufficiently loaded on its factor and deemed adequate for inclusion in the model (Hair et al., 2014; Shaufique et al., 2009).
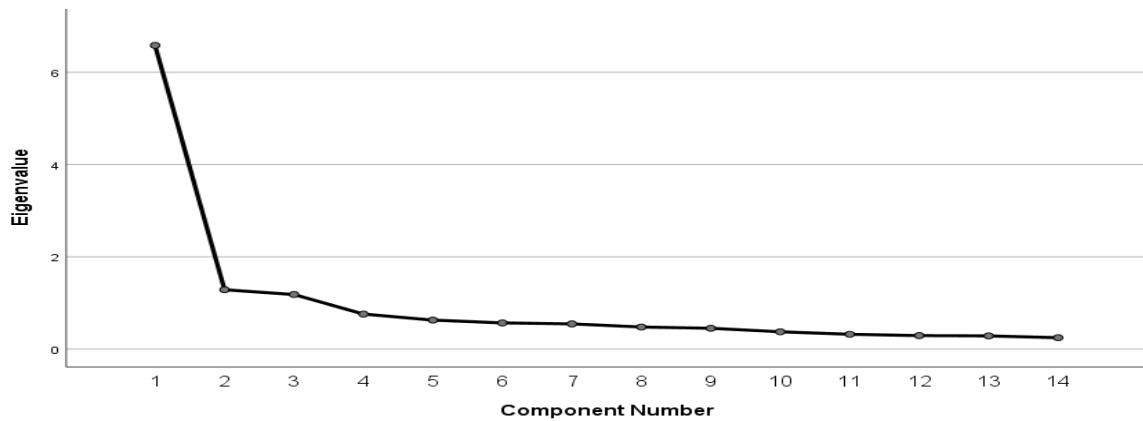
Figure 7: Scree Plot

Figure 2 illustrates how many factors are to be retained. Even though there are several ways to identify number of factors (Courtney, 2013), this paper adopts the Kaiser's eigenvalue rule and scree plot method which suggests factors with value over 1 should be retained. The point of interest is where the curve starts to flatten. It can be seen that the curve begins to flatten after the 4th factor. In other words, factor number 4 and onwards have an eigenvalue of less than 1. Therefore, this factor analysis retains only three factors.

Table 27: Rotated Component Matrix

Indicator	Component / Factor		
	1	2	3
UA (Uncertainty Avoidance)	0.181	0.803	0.211
PD (Power Distance)	0.232	0.752	0.213
CI (Collectivism)	0.256	0.787	0.161
FO (Future Orientation)	0.366	0.692	0.192
O (Overconfidence)	0.252	0.274	0.777
HM (Herd Mentality)	0.362	0.203	0.647
LS (Loss Aversion)	0.088	0.329	0.708
Anchoring (A)	0.270	0.039	0.751

CS (Capital Structure)	0.744	0.219	0.258
CC (Cost of Capital)	0.776	0.227	0.047
IA (Investment Appraisal)	0.762	0.210	0.267
WC (Working Capital)	0.698	0.183	0.246
PR (Profit Retention)	0.610	0.226	0.345
DP (Dividend Policy)	0.680	0.261	0.206

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations.

The patterns of responses are mainly clustered under three main components or factors are depicted in table 3. Even though few variables illustrate cross loadings, those values are lower than 0.40. The first component includes six (6) variables those measured the factor irrationality of financial decision making (IFDM) behaviour of entrepreneurs. The second component consists of four (4) variables those used to capture factor of the national cultural psychology (NCP). Finally, four (4) variables used to measure the factor of bounded rationality (BR) are clustered together. The total variance explained) by the three factors was 64.3 percent (Appendix 06), indicating that all the items were moderately sufficient to further measurement model analysis.

Reliability test for EFA: However, prior to moving forward with CFA, it is essential to test the internal consistency reliability of the factors extracted in the EFA. For that, Cronbach's alpha is used for each component.

Table 28: Cronbach's Alpha Summary for three factors

Factor Name	Cronbach's Alpha	N of Items	Result
National Cultural Psychology	0.847	4	Very Good
Bounded Rationality	0.758	4	Respectable
Irrationality in Financial Decision Making	0.865	6	Very Good

Table 4 presents Cronbach's alpha values calculated for each factor. These values were above the threshold of 0.7 (Hair et al., 2014), indicating that all the indicators are internally consistent

and reliable to be used as measurement and adequately measured the construct variables. Therefore, all the items should be retained for further analysis.

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis is used to test theoretical links existing among earlier identified three factors named as National Cultural Psychology, Bounded Rationality and Irrationality in Financial decision making. These relationships are used to explain the causal nature of one factor to another while testing relevant hypotheses.

National Cultural Psychology (NCP) and Bounded Rationality (BR): In the conceptual framework (Figure 2.1), the first hypothesis of this paper is to test relationship between National Cultural Psychology and Bounded Rationality.

Table 29: NCP and BR

	Estimate	S.E	C.R	P
BR ← NCP	0.748	0.098	7.608	****

Table 05 shows that there is a statistically significant relationship (p<0.05) between the Bounded rationality and National Cultural Psychology. Therefore, the first null hypothesis can be rejected.

Bounded Rationality (BR) and Irrationality in Financial Decision Making (IFDM): the relationship existing in between the BR and IFDM can be summarised as follows,

Table 30: IFDM and BR

	Estimate	S.E	C.R	P
IFDM ← BR	0.763	0.107	7.103	****

As demonstrated table 6, there is a statistically significant relationship (p<0.05) between the Irrationality in Financial Decision Making and Bounded rationality. Therefore, the second null hypothesis can be rejected.

National Cultural Psychology (NCP) and Irrationality in Financial Decision Making (IFDM): Testing the relationship between NCP and IFDM is much crucial since it is essential to perform the mediation analysis under next section (4.3). Therefore, the nature of the relationship between NCP (Independent Variable) and IFDM (Dependent Variable) without BR (Mediating Variable) is tested as follows,

Table 31: Regression Weights for NCP and IFDM

	Estimate	**S.E**	**C.R**	**P**
IFDM ← NCP	0.588	0.77	7.679	****

As illustrated on Table 07, the regression weight for NCP in the prediction of IFDM is significantly different from zero at the 0.001 level (two-tailed). Therefore, it can be concluded that total effect between NCP and IFDM is statistically significant. However, it is unknown that this relationship is exclusively existing in between NCP and IFDM or via another third mediating variable. In other words, to carry out more sophisticated cause and effect analysis, it is required to test to what extent this statically significant relationship is mediated by the bounded rationality variable (BR). In order to do that, it can be used a path diagram which includes the mediator variable of BR.

Mediation Analysis

The nature of the relationship existing in between three latent variables is analysed under this section.

National Cultural Psychology and Irrationality in Financial Decision Making without Mediator: In order to test the mediation, it is firstly required to examine the direct effect existing between the NCP (IV) and IFDM (DV) without the mediator.
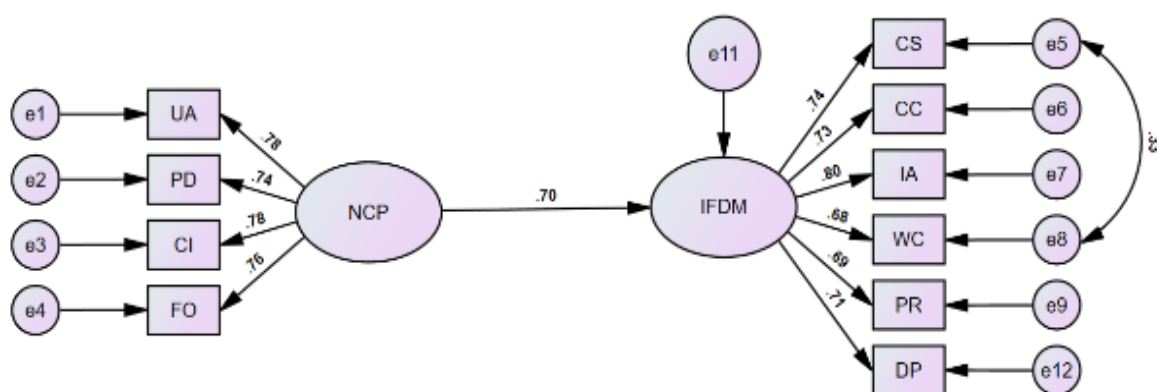
Figure 8: Path Diagram without Mediator

Figure 3 illustrates the path diagram which links two measurement models and one structural model. The first measurement model demonstrates the latent variable of national cultural psychology of entrepreneurs and its four indicators extracted from House et al (2004) and Hofstede's (2001) national cultural dimensions. An examination of modification indices (MIs) suggests evidence of misfit as standardized residuals of CS and WC loaded on IFDM construct indicated to share relatively high covariances with each other. Therefore, the model was re-specified by correlating the pairs of residuals belong to same latent construct, as suggested by Hooper et al. (2008). According to the diagram, UA, PD, CI and FO are showing over 0.70 correlations with NCP and therefore, this finding supports these national cultural theories. The second measurement model depicts the latent variable of Irrationality in Financial Decision Making and its six indicators originated from three types of decisions explained by Ogilvie (2009). The loadings of these measurement model reveal that entrepreneurs are likely to make financial decisions diverting from the rationality. These findings contradict with most of conventional theories in finance management (ex: pecking order) those suggests that key financial decisions are often made with a full rationality.

National Cultural Psychology (NCP) and Irrationality in Financial Decision Making (IFDM) with Mediator of BR : The purpose of this mediation analysis is to examine the nature of direct and indirect effects existing in between NCP and IFDM with the mediating effect of BR.
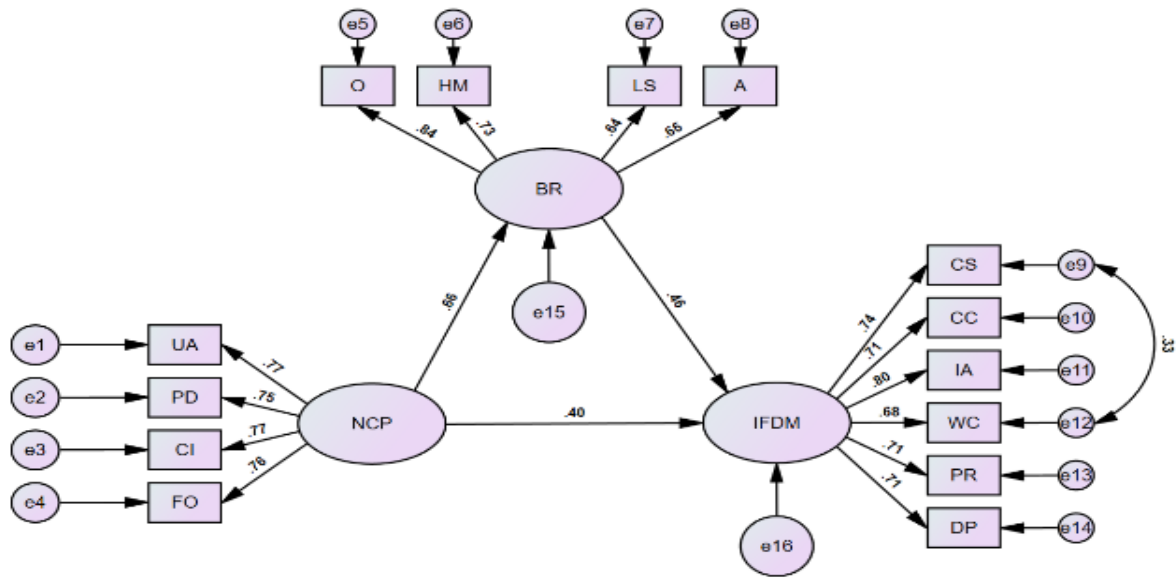
Figure 9: Path Diagram with Mediator

Figure 04, path demonstrates all the individual factor loadings of indicators and their respective latent variables. In addition, it shows indirect and direct effects existed among three latent constructs. However, the total effect (0.70) earlier existed in between NCB and IFDM in Figure 3 has been reduced up to 0.40 when it comes to Figure 4. In other words, total effect has been decreased by 0.30 with the presence of Mediator. Even though this can be considered as an initial indication for a mediating effect, the statistical significance of this mediating effect and its nature (partial or full mediation) are analysed as follows,

Table 32: Regression Weights among NCP, BR and IFDM

	Estimate	S.E	C.R	P
BR ← NCP	0.722	0.094	7.696	***
IFDM ← BR	0.349	0.075	4.652	***
IFDM ← NCP	0.337	0.081	4.160	***

In considering the regression weights of above table VIII, all the relationships existing among latent variables each other are statistically significant. In order to test the mediation effect further, it will be used the Bootstrap Analysis with a 95% Confidence Interval.

Table 33: Summary of Standardised Total, Direct and Indirect Effects

Standardized Effect	Standardized Estimation	P-Value (Two Tailed Significance)	Result
Total Effect of NCP on IFDM (Without BR)	0.704	0.002	Significant
Direct Effect of NCP on IFDM (With BR)	0.403	0.002	Significant
Indirect Effect	0.301	0.001	Significant

The standardized indirect (mediated) effect of NCP on IFDM is statistically different from zero at the 0.001 level (p=.001 two-tailed). Preacher and Hayes (2008) called this standardised indirect effect as the index of mediation since it determines whether there is a mediation or not. This is a bootstrap approximation obtained by constructing two-sided bias- corrected confidence intervals. On the other hand, the direct effect between NCP and IFDM is still statistically significant (p=0.002 <0.05). These both outputs confirm a '***Partial Mediation***' between NCP and IFDM. In other words, National Cultural Psychology of entrepreneurs has a direct relationship with the Irrationality of Financial Decision Making while also having an indirect effect via their Bounded Rationality.

Model Fit

In SEM, the Goodness of fit of the model can be measured using following three model fit measures.

Table 34: Model Fit Summary

Model Fit Type	Measurement	Indices	Threshold	Result	Interpretation
Absolute Model Fit	These measures provide the most fundamental indication of how well the proposed theory fits the data and	Chi-Square Value and Probability Value (X^2) (Meyers et al., 2005)	P<0.05	0.000	Poor Fit
		Root Mean Square Error of	Lower than 0.06	0.057	Good Fit

	proportion of variance (McDonald and Ho, 2002)	Approximation (**RMSEA**) (Meyers et al., 2005)			
		Goodness of Fit (**GFI**) (Chau,1997)	Higher than 0.90	0.925	Good Fit
Incremental Model Fit	These measures assess the incremental fit of the model compared to a null model (baseline model) which hypothesizes as a single factor model with no measurement error (Lee, 2012).	Comparative Fit Index (**CFI**) (Bryne, 2016)	Higher than 0.90	0.964	Good Fit
		Normed Fit Index (**NFI**) (Bryne, 2016)	Higher than 0.90	0.915	Good Fit
		Tucker Lewis Index (**TLI**) (Bryne, 2016)	Higher than 0.90	0.955	Good Fit
Parsimonious Model Fit	This assess the parsimony of the proposed model by evaluating the fit of the model versus the number of estimated coefficients needed to achieve that	CMIN / DF (Hair et al, 2010)	Lower Than <3.0	1.65	Good Fit

	level of fit. (Lee, 2012)				

Model fit is assessed through an inferential Chi-square ($\chi2$) and several descriptive goodness-of-fit indices. Since the Chi-square ($\chi2$) is known to be inflated in samples with N > 200 (Kelloway, 1998) the Chi-square ($\chi 2$) and degree of freedom (df) are reported as descriptive information rather than a strong inferential test of whether a model can be accepted or rejected (Stewart et al, 2017). Table 10 illustrates all the measurements excepting Chi-square ($\chi2$) validate the overall goodness of fit of the proposed model.

Composite Reliability

To measure the internal consistency of confirmatory factor analysis, a composite reliability test is conducted. By conducting this reliability test, the shared variance among the observed variables of their relevant latent construct can be examined. In other words, Composite Reliability was applied to test the degree to which the indicator variables converge and share proportion of variance. The CR value varies between 0 and 1; a higher value implies a higher level of reliability of the items (Hair et al., 2014). In order to accept the internal consistency of the CFA model, composite reliability of measurement model should be greater than 0.6.

Accordingly, the results derived from Composite Reliability (Appendix 07) can be summarized as follows,

Table 35: Summary of Composite Reliability

Latent Variable	Composite Reliability	Interpretation
National Cultural Psychology	0.7629	Good
Bounded Rationality	0.6889	Good
Irrationality in Financial Decision Making	0.7891	Good

Table 11 illustrates that indicator items are reliable, and they shared a high variance with their latent constructs. It implies that the questions used in this paper measure their respective constructs what they were meant to measure reliably and accurately.

Construct Validity

Construct validity refers to the degree to which inferences can legitimately be made from the operationalizations in this study to the theoretical constructs on which those operationalizations were based. Convergent and Discriminant validities are two fundamental aspects of construct validity. Prior to determine convergent and discriminant validities, it is required to calculate the Average Variance Extracted (AVEs)[8] of each factor.

Table 36: Summary of Standardised Loadings and Average Variances Extracted

Indicator Variables	<---	Latent Variables	Standardized Loadings	Square of Standardized Loadings	Sum of the Squared Standardized Loadings	Number of Indicators	Average Variance Extracted (AVE)	Square Root of AVE
UA	<---	NCB	0.775	0.600625				
PD	<---	NCB	0.747	0.558009	2.32307	4	0.5807675	0.7621
CI	<---	NCB	0.77	0.5929				
FO	<---	NCB	0.756	0.571536				
O	<---	CB	0.839	0.703921				
HM	<---	CB	0.727	0.528529	2.068375	4	0.5170938	0.7191
LS	<---	CB	0.646	0.417316				
A	<---	CB	0.647	0.418609				
CS	<---	IFDM	0.78	0.6084				
CC	<---	IFDM	0.702	0.492804				
IA	<---	IFDM	0.801	0.641601	3.22309	6	0.5371817	0.7329
WC	<---	IFDM	0.72	0.5184				
PR	<---	IFDM	0.693	0.480249				
DP	<---	IFDM	0.694	0.481636				

The convergent validity of above three constructs imply to what extent indicators are converged or close together to represent their respective construct. The normal decision rule is that the

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[8] Average Variance Extracted (AVE) = $\sum$ (Standardized Loadings^2) / Number of Indicators

AVE must be 0.5 or greater than 0.5. In considering the AVEs of above table 12, they all have values over 0.5. In other words, all the indicators are converged to their respective latent construct while having higher correlations with indicators those converged within the same construct. These higher AVE values further validate the operationalization and mediation model created earlier. It finally implies that all measures have psychometric quality and reliably measure their respective constructs. The decision rule for discriminant validity is that the positive square root of the AVE for each of the latent variables should be higher than the highest correlation with any other latent variable. In other words, the square root of AVE should be greater than the latent variables correlation.

Table 37: Correlations among Latent Variables

Latent Variable	Correlation
NCP <----> BR	0.660
BR <----> IFDM	0.716
NCP <----> IFDM	0.698

Table 13 illustrates the correlations exist latent variables each other. All these correlation values are lesser than square roots of AVE calculated under Table XII. This implies that three latent factors have sound discriminant validity. In other words, three constructs explored in this study are theoretically different and therefore, the scales used in this study measure three unrelated theoretical constructs. This suggests that all the three construct variables in the measurement model are distinctively different and reflects that each latent variable shared a high variance with corresponding observed items more than the shared variance of items by other latent variables in the model. Similar to higher convergent validity of the study, these discriminant results also prove that this study's variable selection and operationalisation are acceptable.

DISCUSSION

Above mediation analysis indicated that entrepreneurs' national cultural background influences the different cognitive biases reflecting from the entrepreneurs. This cause-and-effect relationship can be scrutinized by considering each components of national cultural background construct and how they do likely trigger the cognitive biases.

Uncertainty Avoidance as the first and most loaded indicator for NCP may have a greater influence on cognitive biasness. This national cultural attribute has a potential to avoid people to take decision which involves higher risks. As a result of that, higher level of uncertainty avoidance triggers loss aversion which is an indicator of bounded rationality. This higher uncertainty avoidance psychologically avert people from loses with lower probability. Therefore, it can be argued that higher level of uncertainty avoidance triggers the loss aversion. Loss Aversion, as an indicator of bounded rationality eventually leads to the irrationality in financial decision making in many ways. Eventually it leads to the irrationality in financial decision making.

Highly uncertainty avoiding entrepreneurs are likely to avoid information that they perceive as potentially unpleasant. In other words, they tend to avoid knowing negative consequences related to a future uncertainty since it may create psychological discomfort within themselves. In behavioural economics, this potential cognitive bias is known as '***The Ostrich Effect'***. As a result of this *ostrich effect* , entrepreneurs or investors attempt to avoid negative financial information. This tendency do not allow entrepreneurs to make a quality rational decision. Therefore, it is clear that this higher uncertainty avoidance triggers entrepreneurs to be loss aversive but also for other related psychological biases. attribute further However, loss aversion avoids entrepreneurs thinking about the rationality behind the time value of the money since they comparatively keep higher weights psychologically on the loss they are experiencing at present. This finally deviates them from the rationality.

Higher power distance is another main national cultural attribute reflected from the selected group of entrepreneurs. It is commonly believed that cultures where a higher power distance is rooted has a less room for participatory (democratic) leadership whereby leaders are not likely ask for the opinions of subordinates and subordinates rarely challenge leadership decisions. Assuming that entrepreneurs as business leaders, one can rationally argued that entrepreneurs with a higher power distance background show a centralised decision making within their business. In other terms, these entrepreneurs are not keen to delegate the authority or involve subordinates in the decision making. This finally leads them to being overconfident in decision making. On the other hand, this higher power distance mentality psychologically stimulate entrepreneurs to believe that the decisions made by themselves are rather successful than the decisions made by others. On the other hand, Entrepreneurs believe that they should directly involve in the operational process while having a less confidence in the work carried out by

their workers. In other words, they are likely to reflect **'The Endowment effect'** in which they disproportionately overvalue the products, decisions and operations partially or fully involved by themselves (Kahneman et al, 1991; Ericson and Fuster, 2014) rather than others. As a result of this, entrepreneurs tend to involve in the most of operational activities believing that those activities will be effective only if they would be performed or involved by themselves. However, dedicating unnecessary extra time for operational activities reduces the time that can be allocated to manage the business and make plans for future developments. This can be considered as an overconfidence on themselves and simultaneously, an underestimation on tasks carried out by others. As discussed earlier, overconfidence causes to bounded rationality and finally irrationality in decision making.

Higher level of collectivism was detected from respondents and it means that a greater level of collectivism triggers cognitive biases such as herd mentality and it finally causes them lagging behind them in making rational financial decisions. For example, due to the higher collective nature of entrepreneurs, they are often keen to follow the decisions taken by their business colleagues in a similar situation. In other terms, this collectivist attribute makes entrepreneurs to over rely and imitate others. This can be considered as *'Bandwagon Effect' in which* the entrepreneurs are likely to adopt a certain behaviour, style, or attitude simply because everyone else is doing it. As a result of this bandwagon effect, entrepreneurs may incline to make a decision based on solely on the decisions of other entrepreneurs, while disregarding their own personal knowledge and information to the contrary. This can be considered as an *Information cascade*[9] and it avoids them being rational and find their own best decision. Hence, this high collectivist nature is presumably caused to herd mentality bias which is known as one of reason of the factor of bounded rationality. Not only that, high collectivism nature possibly leads to Anchoring bias. Higher Future (long term) orientation is another major indicator of the National Cultural Psychology. This attribute may cause to bound the rationality in different ways. Higher long term orientation psychologically stimulates entrepreneurs to focus and attain long term future rewards with a greater tendency of loss aversion on short term gains. This long term orientation presumably links with the *'Disposition Effect'* in which entrepreneurs have a tendency to sell profitable investments too early before

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[9] ***Information Cascade*** – *An information cascade occurs when an individual's response to a situation depends more on his/her perception of other people's response to the situation than to the evidence or private information that the situation itself presents to him/her (Roe et al, 2018)*

realizing all potential gains while holding on to losing investments for longer than they should, believing that the investments will turn around and generate a profit in future. This reluctance to sell losing investments may possibly make further loses. And also, this bias is again correlated with the loss aversion since they are greatly distressed by the loss selling those losing investments rather than retaining them. Therefore, Disposition effect and Loss aversion can be considered as two sides of a same coin. In addition, long term oriented mindset possibly creates psychological reference points or anchors for future financial returns. These reference points do not allow them to surpass potential financial returns because they satisfy with the achievement of expected return which was anchored earlier.

MODEL DEVELOPMENT

Based on the findings derived from the above discussion, it can be developed a new concept which demonstrates how national cultural factors drive entrepreneurs to the irrationality in financial decision making.
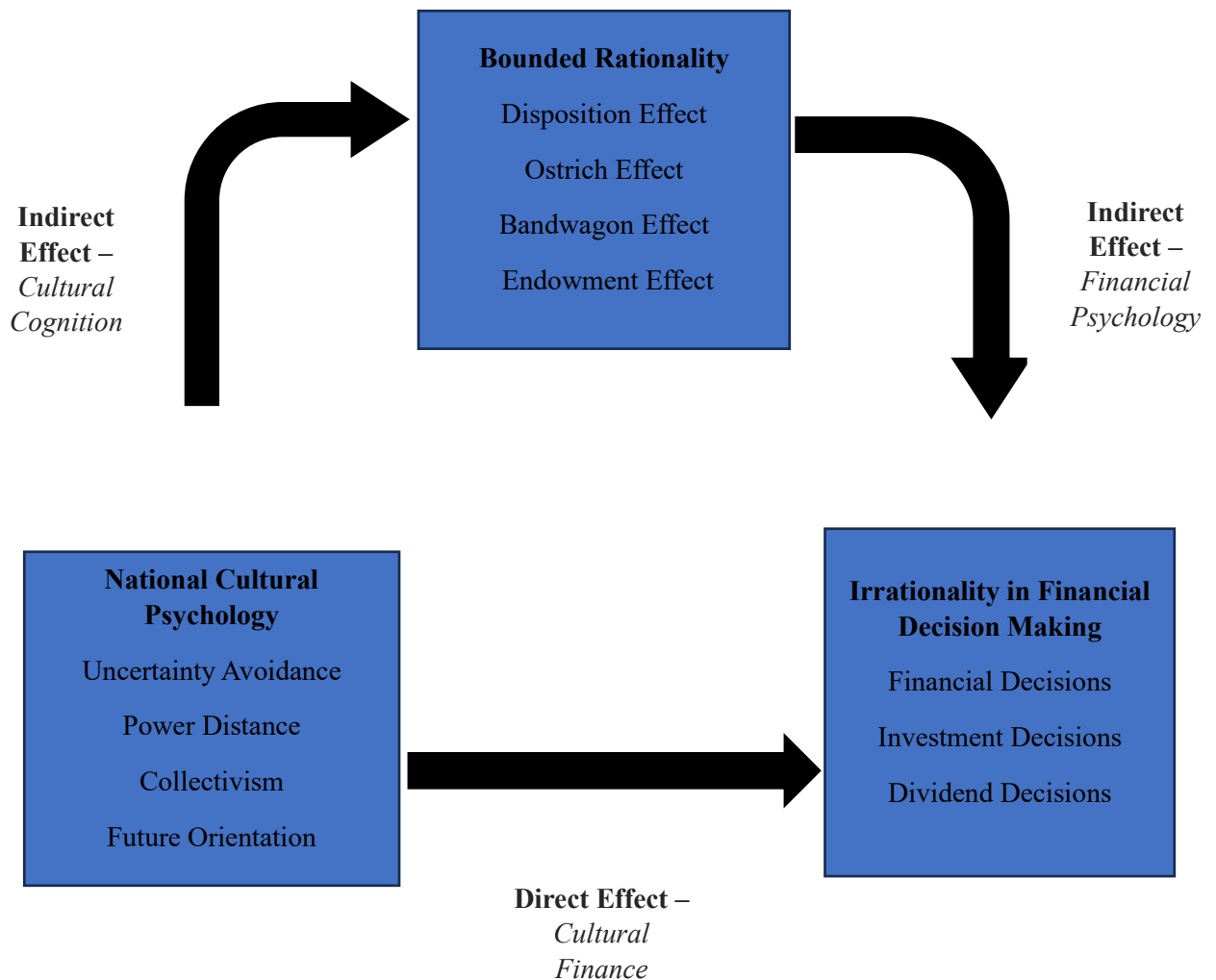
Figure 10: Mediation effect theory of national culture and behaviour finance in financial decision making

This study develops a mediation effect theory of national culture and behaviour finance on financial decision making in ethnic minority business (Figure 5). Entrepreneurs' national cultural attributes determine different cognitive biases and then directly and indirectly lead to the irrationality in financial decision making. According to pecking order theory, firms follow the hierarchy of funding options, i.e., capital reserve, debt financing, and equity financing relatively. However, this paper found that EMB entrepreneurs are less likely retain profits for future investments. This indicates that EMBs divert from the rationality when they utilise their profits.

Further, this finding is aligned with that of Kanagaretnam et al. (2016), Li et al. (2013) and Chui et al. (2002) who found that national cultural attributes have statistically significant relationships with financial management decisions in internal control, corporate risk taking, capital structure decisions. However, these scholars have not studied the composite effect made by national cultural attributes together on the irrationality in financial decision making. This potential gap has been addressed in this paper. On the other hand, the common gap in behavioural finance literature was their lack of focus on cultural drivers. Even though previous literature suggest that bounded rationality is triggered by cognitive factors (Marciano and Ramello, 2014), how these factors are shaped by their national cultural attributes was not explained. This lack of causation was remained under research until this paper reveals that national cultural attributes cause the mindset behind their bounded rationality. This new theoretical model explains the entrepreneurial decision-making behaviour of EMBs and how far entrepreneurs divert from the rationality when making financial decisions due to an invisible psychological effect created by their national cultural attributes and cognitive biases. This study suggests that Ethnic Minority Business (EMB) entrepreneurs should understand their own national cultural background and be aware of possible cognitive biases and adjust their judgements when making financial decisions. In addition, the authorities those are interested in encouraging ethnic minority business entrepreneurs should recognise the diversity of national cultures and understand different national cultural characteristics. The authorities may make different policies to reflect different EMB entrepreneurial behaviour.

For the purposes of the study, the UK social (culture) and economic context was assumed stable and assumed have had little effect on Sri Lankan entrepreneurs during the period of the study. These assumptions were made because early field work suggested that the Sri Lankan national culture was the major influence on financial decision behaviour of Sri Lankan entrepreneurs running their businesses in the UK. However, once the detailed questionnaire survey and analysis was complete, a more critical stance was taken of these assumptions. These point to further research possibilities.

The detailed study indicated that the initial field insights the study and assumptions were based on a 'home country' bias by Sri Lankan entrepreneurs as they highlighted the importance of their culture of origin. In contrast, the study results, indicated that there was potential for Sri Lankan cultural influence to be modified by UK cultural influence and economic setting. The UK cultural context in combination with Sri Lankan culture was recognised as potentially

having a further mediating impact on behavioural finance states and subsequent irrationality in financial decision behaviour. Thus, some of behavioural finance states (overconfidence, herd mentality, loss aversion, anchoring) may have been influenced by joint cultural influences. This may explain some of the results. For example, a higher level of collectivistic nature in Sri Lankan entrepreneurs stimulates the herd mentality while individualistic UK culture moderate that effect. These point to further research possibilities; whereby combined national cultural characteristics (say Sri Lankan and UK) are investigated for their combined impact on behavioural financial decision biases. These can then be investigated for combined impact on irrationality in financial decision making.

The model developed in this paper can be used to measure the concepts and statistically investigate links between a combined national Cultural Psychology measure, Cognitive Biasness, and Irrationality in Financial Decision Making of Ethnic Minority Entrepreneurs. This could be a powerful tool and perspective for further research.

CONCLUSION

In summary, this paper examines the relationship between national cultural attributes and cognitive biases and irrationality in financial decision-making reflecting from a subset of ethnic minority entrepreneurs (Sri Lankan) in the UK and how these factors impact on their irrationality in financial decision making. The primary data were collected from 200 Sri Lankan entrepreneurs and analysed through EFA and CFA. This paper finds a mediating effect of bounded rationality on the relationship between national cultural attributes and irrationality in financial decision making. The statistically significant direct effect between national cultural psychology and irrationality in financial decision making suggests that national cultural attributes have an impact on financial decision making. This finding supports Paul and Shrivastava's (2015) argument that entrepreneurial traits are intrinsic personality factors influenced by learned cultural behaviour.

This paper bridges three theoretical paradigms and opens a novel research path for future researchers who are mainly interested in Cultural and Behavioural Finance. However, this paper was limited to only four national cultural attributes. Therefore, future researchers are encouraged to consider other national cultural dimensions such as Masculine/Feminism, Indulgence etc. Not only that, this paper mainly examined the mediation effect created by bounded rationality using five cognitive biases. Future researchers can consider other cognitive

biases in the behavioural finance and examine how they mediate or moderate the relationship between national cultural background and financial decision making of entrepreneurs. In addition, this research has not considered how cognitive biases influence towards the satisficing which is another main aspect in rational decision making and twin concept to the bounded rationality.

REFERENCES

Ackert, L.F. (2014), 'Traditional and Behavioural finance, Investor Behaviour': *The Psychology of Financial Planning and Investing*, Vol. 1, pp. 25-41.

Bagozzi, R.P., Yi, Y. (1988), 'On the evaluation of structural equation models', *Journal of the Academy of Marketing Science*, 16, 74–94,

Barberis, N. and Thaler, R. (2003), *A survey of behavioural finance, Handbook of the Economics of Finance*, National Bureau of Economic Research, Massachusetts Avenue Cambridge, MA, Vol. 1, pp. 1053-1128.

Bhair, C M, Lucey, B (2014), 'Culture's influences: An investigation of inter-country differences in capital structure', *Borsa Istanbul Review*

Brown, T. A. (2015), *Confirmatory Factor Analysis for Applied Research*, Guilford Press

Cetenak E.H., Cingoz A., Acar E. (2017) The Effect of National Culture on Corporate Financial Decisions. In: Dinçer H., Hacioğlu Ü. (eds) Risk Management, Strategic Thinking and Leadership in the Financial Services Industry. Contributions to Management Science. Springer, Cham

Chang, K, Wee, J B, Yi (2012), Does National Culture Influence the Firm's Choice of Debt Maturity?, *Asia pacific journal of financial studies.*

Chang, K, Sung C B, Kang E (2012), Culture, corporate governance, and dividend policy: international evidence*, Journal of Financial Research*

Chui, A., Lloyd, A. & Kwok, C (2002) The Determination of Capital Structure: Is National Culture a Missing Piece to the Puzzle?. *J Int Bus Stud* 33**,** 99–127

Courtney, M. G. R. (2013), Determining the number of factors to retain in efa: Using the spss r-menu v2. 0 to make more judicious estimations. Practical Assessment, Research & Evaluation, 18 (8), 1–14.

Department for communities and local government (2013), Ethnic Minority Businesses and Access to Finance, [Online], Available at: Title (publishing.service.gov.uk) [Accessed on:5ᵗʰ Aug 2021]

Dittrich, D A, Guth, W, Maciejovsky (2007), Overconfidence in investment decisions: An experimental approach, The European Journal of Finance

Ericson, K. M. M., & Fuster, A. (2014). 'The endowment effect'. *Annual Review of Economics, 6*(1), 555-579.

Giddens, A (2013), The constitution of society, Wiley Publications

Hair JF, Black WC, Babin BJ, Anderson RE (2010) Multivarite Data Analysis. Seventh edition. Prentice Hall, New Jersey

Kahneman, D, Griffin, D, Gilovixh, T (2002), Heuristics and Biases; the Psychology of Intuitive Judgement, Cambridge University Press

Kahneman, D, Tversky, A (2000), *Choices, Values and Frames*, Cambridge University Press

Kahneman, D. and Tversky, A. (2013), "Prospect theory: an analysis of decision under risk", Handbook of the Fundamentals of Financial Decision Making: Part I, World Scientific, London, pp. 99-127.

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). ,Anomalies: The endowment effect, loss aversion, and status quo bias'. *Journal of Economic Perspectives, 5* (1), 193-206.

Kanagaretnam, K, Lobo, G J, Chen, M, Zhou, J (2014), 'National Culture and Internal Control Material Weaknesses Around the World', Journal of Accounting, Auditing & Finance, vol. 31

Kelloway K.E. (1998) Using Lisrel for Structural Equation Modeling: A researcher's guide, Thousand Oaks: CA: Sage Publications.

Kitching, K, A, Mashruwala, Pevshner, M (2016), 'Culture and Cost Stickiness: A Cross-Country Study', *International Journal of Accounting*

Li, Kai & Griffin, Dale & Yue, Heng & Zhao, Longkai, (2013) 'How Does Culture influence corporate risk-taking?' *Journal of Corporate Finance, Elsevier*, vol. 23(C), pages 1-22.

Lin, H (2011), 'Elucidating rational investment decisions and behavioural biases: Evidence from the Taiwanese stock market', *African Journal of Business Management*. Vol. 5

Madaan, G, Singh, S (2019), An Analysis of Behavioural Biases in Investment Decision-Making, International Journal of Financial Research

Meyers L.S., Gamst G.C, Guarino A.J. (2005) Applied Multivariate Research: Design and Interpretation. Sage Publications, Thousand Oaks.

Michiels, A, Uhlaner, L, Dekker, J (2017), The effect of family business professionalization on dividend Payout, Journal of Small Business and Enterprise Development Vol. 24 No. 4, p. 971-990

Ogilvie, J (2006), Management Accounting – Financial Strategy, Elsevier Science & Technology Books.

Rao,P, Kumar, S (2018), Reflection of owner's attributes in financing decisions of SMEs, Small Enterprise Research

Rasool, N, Ullah, S (2019), Financial literacy and behavioural biases of individual investors: empirical evidence of Pakistan stock exchange, *Journal of Economics, Finance and Administrative Science Vol. 25 No. 50*, 2020 pp. 261-278

Ricciardi, V and Simon, H (2000), What is Behavioural Finance? Business, Education Technology Journal.

Roe, J, deForeset, R, Jamshidi, S (2018), *Mathematics for Sustainability*, Springer

Shabarisha, N (2015), Heuristic and Biases related to financial investment and he role of behavioural finance in investment decisions – A Study, International Journal of Business Economics & Management Research

Shah R., Goldstein S.M (2006)., Use of structural equation Modeling in operations management research: looking back and forward, Journal of Operations Management, 24, 148–169

Shao, L; Kwok, C; Guedhami, O 2010)."National culture and dividend policy". Journal of International Business Studies. 41 (8): 1391–1414

Simon, H A (1997), Models of Bounded Rationality; Empirically Grounded Economic Reason, MIT Press

Stephan, U, Pathak, S (2016), Beyond cultural values? Cultural leadership ideals and entrepreneurship, Journal of Business Venturing . Vol 31

Stewart, R A, Wipulanusat, W, Panuwatwanich, K (2017), Workplace innovation: exploratory and confirmatory factor analysis for construct validation, Management and Production Engineering Review

Stommel, E (2012), Reference-Dependent Preferences: A theoretical and experimental investigation of Reference Point Formation, Springer Gabler

Swanson, R A, Holton, E F (2005), Research in Organizations; Foundations and Methods of Inquiry, Barret-Koehler Publishers

Thaler, R. H. (1999). The end of behavioural finance. Financial Analyst Journal, 55(6), 12 17.

Wang, M, Rieger, M O, Hens, T (2017), The Impact of Culture on Loss Aversion, Journal of Behavioural Decision Making, 30: 270–281

APPENDICES

Appendix 01: Indicators of National Cultural Psychology

National Cultural Dimension	Theoretical Definition	Working Definition
Uncertainty Avoidance:	The extent to which a society, organization, or group relies (and should rely) on social norms, rules, and procedures to alleviate unpredictability of future events (House et al., 2004)	The extent to which EMBs give priority on social norms, rules, and procedures to alleviate unpredictability of future events in the process of financial decision making.
Power Distance	The extent to which the community accepts and endorses authority, power differences, and status privileges (House et al 2004).	The extent to which EMBs are ready to delegate the financial decision-making authority.
In group collectivism	The degree to which individuals express (and should express) pride, loyalty, and cohesiveness in their organizations or families (House et al, 2004).	The extent to which EMBs takes financial decisions collectively or as a team.
Future Orientation:	The extent to which individuals engage (and should engage) in future-oriented behaviors such as planning, investing in the future, and delaying gratification (House et. al., 2004).	The extent to which EMBs evaluate results of financial decisions and foresee the outcomes after rational financial appraisals.

Appendix 02: Indicators of Bounded Rationality

Cognitive Biases	Theoretical Definition	Working Definition
Overconfidence	A cognitive bias which relates to the overestimation and unrealistic assessment on a person's knowledge and talent in decision making (Kahneman, 2011).	Over reliance on gut feeling and the knowledge of entrepreneurs when making a financial decision.

Herd Mentality	Herd mentality is a philosophical phenomenon which describes how people can be influenced by their peers to adopt certain behaviors on a largely emotional, rather than rational, basis (Kahneman et al, 2002).	Psychological tendency of entrepreneurs to imitate others or being influenced by other peers in financial decision making.
Heuristics in Judgement	Heuristics in judgement are straightforward strategies or mental processes that humans, animals, organizations and machines use to quickly form judgements, make decisions and find solutions for complex problems (Kahneman et al, 2002).	Entrepreneurs' inclination to rely on mental shortcuts in financial decision making.
Loss aversion	Loss aversion is preference of investors' satisfaction on lower but sure gain and avoidance of chances of higher but unsure gains (Kahneman et al, 2002).	Entrepreneurs' discomfort on the pain of a loss rather than the enjoyment of making a profit.
Anchoring	The influence of an anchor that renders the final judgement too close to the anchor or a reference point (Kahneman et al, 2002).	Entrepreneurs' tendency to compare and judge his/her future economic return with a reference point influenced by other external factors.

Appendix 03: Indicators of Irrationality in Financial Decision Making

Types of Financial Decisions	Theoretical Definition	Working Definition
Financial Decisions	Financing decisions relate to acquiring the optimum finance to meet financial objectives and seeing that non-current assets and working capital are effectively managed (Ogilvie, 2006)	The irrational decisions taken by the EMB entrepreneurs in selecting sources of finances for long term financial requirements and their capital structure.
Investment Decisions	A long term (Capital budgeting) or short-term (Working Capital) financial decision which is concerned with how the firm's funds are invested in different assets is	The irrational decisions made by the EMB entrepreneurs with respect to the amount of funds to be deployed in the investment opportunities.

	known as investment decision (Ogilvie, 2006).	
Dividend Decisions	Dividend decisions relate to the determination of how much and how frequently cash be paid out of the profits of an entity as income for its proprietors (Ogilvie, 2006)	The irrational decisions made by the EMB entrepreneurs with respect to the way of dividend distributions and use of profits.