# A Conceptual Framework for Bounded Rationality in Bank Officers' Credit Decision for SME Lending in Malaysia

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## ABSTRACT

Based on the Bounded Rational Theory, ideally, bank credit officers would be influenced by both rational (fundamental factors) and irrational (behavioural factors) in their credit assessment and decision making process. Emphasizing on the irrational decision making perspective, behavioural factors distort the credit decision making process in the banking industry. Despite such evidence, the psychology perspectives in bank lending practice has been given little attention in research and neglected in practice and policy perspectives. This conceptual research investigated the role of irrationality in bank lending decision making. The research design involved three stages. The research started with conceptualization of the bounded rational credit decision framework. This was designed based on review of three theories and related empirical evidence. In the second stage, constructs and their measurement items were sourced from prior work. Thereafter, a questionnaire was developed. In the third stage, the validity of the questionnaire was tested using expert validation, pre-test and pilot-test involving 30 credit officers working in business banking division of a Malaysian bank. Findings from the pilot study confirmed the validity of the questionnaire as an instrument that can be used for future empirical test. This bounded rational credit decision framework can guide further empirical analysis on the role of behavioural factors in lending decision making. The framework provides new insights that are valuable in enhancing the SMEs lending theory, practice, and policy.

**Keywords**: behavioural finance, bounded rational theory, business banking, credit decision, small and medium-sized enterprises (SMEs)

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## INTRODUCTION

A bank is a major source of financing and critical for the growth of small and medium-sized enterprises (SMEs) in Malaysia. Sustaining SMEs growth is important to the country since SMEs contribute about 37.1% of gross domestic product and provide employment opportunities to more than four million employees in Malaysia (SME Annual Report, 2017/2018). However, despite numerous initiatives that have been implemented in Malaysia over the years to improve SMEs' access to finance, SMEs still have difficulties obtaining financing from banks. This matter has been well reported in the Malaysia Central Bank policy paper (BNM, 2017; 2018), World Bank policy paper (Abraham & Schmukler, 2017), major newspapers (The Star, April 1 2019, The Edge, October 11, 2019) and academic research (Saleh & Ndubisi, 2006; Aris, 2007; Harif, Hoe, & Zali, 2011; Zairani & Zaimah, 2013; Ramlee & Berma, 2013; Wonglimpiyarat, 2015; Yoshino & Taghizadeh-Hesary, 2019; Wasiuzzaman, Nurdin, Abdullah, & Vinayan, 2020). The SME financing issues can be rationalized from the demand-side (firms) and the supply-side (banks) perspectives.

Focusing on the supply-side, in commercial banking practice, credit analysis for SMEs loan application are done by internal credit officer's where they are the ones who decide whether or not to approve a loan. Based on the Bounded Rational Theory (BRT), ideally, bank credit officers would be influenced by both rational factors (fundamental) and irrational factors (behavioural) in their credit assessment and decision making process. From the rational decision making perspective, commercial banks perform a systematic analysis for all SMEs credit applications using the standard 5Cs credit analysis. The analysis parameter includes the character, capacity, capital, collateral, and condition which are the 5Cs of lending that determine SMEs creditworthiness (Wasiuzzaman, Nurdin, Abdullah, & Vinayan, 2020). From the irrational decision making perspective, behavioural factors are believed to be influence the decision making process in the banking industry (Kang & Park, 2019). In particular, evidence on bankers lending decision making highlights the following gaps; (i) Loan officers demonstrate a number of psychological decision making biases; (ii) Loan officers use intuition in addition to deliberation when making lending decisions; and (iii) The use of intuition depends on organizational and situational factors (Trönnberg & Hemlin, 2012; 2014). In lending practice, behavioural

biases often occur in the lending assessment and decision making process (D'Angelo, Mustilli, & Piccolo, 2018). Particularly when credit officers use soft information like borrower personal characteristics, prior relationship, historical performance, and recommendations by a third party in credit assessment will be affected by behavioural biases (Campbell, Loumioti, & Wittenberg-Moerman, 2019). With behavioral-biased decisions, bank officers could have rejected/accepted good/bad creditworthiness borrowers as a result of behavioural biases in the credit assessment and decision making process.

Such biased decisions are unfavorable both to the banks and firms. This could be one unknown reason for the rejection of SMEs loan applications by banks and higher non-performing loans among SMEs. Accordingly, behavioural biases in lending assessment and decision making need to be recognized and managed in bank lending practices. Despite this fact, little is known about behavioral biases in bank lending decision making. This paper aims to provide conceptualization of the bounded rational decision in bank lending assessment and decision process by identifying key behavioral biases as well as ways to minimize the influence of behavioural biases among bank credit officers. Theoretically, this research extends the behavioural finance approach in SMEs lending. Practically, this would provide new insights to Malaysian banking practice and valuable for SMEs financing policymaking in the Malaysian context.

## THEORY AND EVIDENCE

### The Theories

The BRT of human behaviour proposes the assumption of perfect rationality where people can make decisions that are rational, but within the limit of information available to them by using mental capabilities (Simon, 1972; Selten, 1990). In addition, complete rationality is bounded by the insufficiency of knowledge. Furthermore, individuals may be bound by their perceptions of purpose that affect them in making their decisions since cognitive decision making capacity of humans cannot be fully rational due to the complexity in their choices of making decisions (Hernandez & Ortega, 2019). Due to bounded rationality, individuals aim to satisfy instead

of maximizing the results (Misuraca, Faraci, Gangemi, Carmeci, & Miceli, 2015). In real decision making processes, people are trying to make choices to a decision as rationally as possible given the circumstances and the limit that people face. In connection to this paper, bank credit officers may make irrational decisions when analyzing loan applications from SMEs because they are unable to be fully rational due to the complexity of their decisions and limitations in human mental capacity. The following theories are referred as underpinning theories to understand bounded rational decision making of bank credit officers and ways to minimize behavioral biases in individual credit officers.

*The Rational decision theory* - The rational choice theory implies that a person has preferences from the available choices to choose the option they prefer. When making a rational decision, individuals are expected to take into account all available information, probabilities of events, and potential costs and benefits in determining preferences, and to act consistently in selecting the best choice of action (Gabor, 1976; Evans, Over, & Manktelow, 1993; Doyle, 1999; Koechlin, 2020). Ideally, analytical decision making is assumed to be less influenced by biases (Dane, Rockmann, & Pratt, 2012).

*The Intuitive decision theory* - In the behavioural decisions, the intuitive decision making theory describes the decision process by which information used in assessment to arrive at a decision is acquired through prior learning and stored in individual memory and accessed unconsciously (automatic) during the process of decision to form the basis of a judgment (Oliveira, 2007; Organ & O'Flaherty, 2016). In connection to this theory, bank credit officers may analyze a loan application from SMEs using their own intuition unconsciously during the process of making a decision whether or not to approve a loan. In a similar vein, intuition is a component of the cognitive-affective decision-making process (Dunn et al., 2010). Experts have pointed out that intuition-based decisions are frequently biased (Dane et al., 2012) due to reliance on non-fundamental criterion in decision making.

*The Human capital theory* - This Theory was first coined by (Becker, 1964) which says that decision making depends on human capital characteristics. It informs that variation in human decision could be task-specific (Gibbons & Waldman, 2004) and individual, organizational and

country specific (Bae & Patterson, 2014). In specific applications to banking research, Bruns, Holland, Shepherd, and Wiklund (2008) used this theory to explain how education, banking experience, and lending experience matter in influencing bank officers' lending decisions. In the context of this research, this Theory could provide insights on ways to minimize behavioral biases in lending decision making through improvements in the human capital elements of credit officers.

## Evidence

### *Bounded rational credit decisions*

Bounded rationality in credit decision making is concerned about the influence of both rational (fundamental) and irrational decisions (behavioral) by bank officers' in doing credit assessment and decisions. In banking practice, fundamental credit decisions are guided by the 5Cs of credit analysis. In business banking departments, the 5Cs credit analysis are performed manually by the attending credit officers with reference to various sources of information which include business profile, financial statements, credit records with financial institutions, site visits and reputation checks with business partners associated with borrowers. The measurement items for fundamental credit decision have been well documented with variations. This research replicates measurement items for fundamental credit decisions from Palazuelos, Crespo, and Corte (2017). Behavioral decision could also influence credit officer decisions through the influence of behavioural decision channels in the decision making process. So far, no measurement items for behavioural biases have been developed specifically for bank credit decisions. This research adapted the behavioural decision-making style from Scott and Bruce (1995) for behavioural credit decisions.

### *Rational factors in credit decision making*

The concept of rational behavior in lending decision making is used by commercial banks to conduct a systematic analysis for all credit applications from SMEs using the standard 5Cs credit analysis. The SMEs creditworthiness will be determined by the analysis parameters which include character, capacity, capital, collateral, and condition, which are the 5Cs of lending. This 5Cs of credit analysis fundamental approach has been traditionally used in commercial banks (Janckowicz & Hisrich, 1987). In Malaysia, the 5Cs of credit analysis are widely used in banks by bank

officers to assess SMEs loan applications. In the credit analysis context, the application of 5Cs of credit requires expert subjective judgement (Yu, Li, Tang, Zhang, & Kou, 2015) to judge the creditworthiness of a lending application based on the 5Cs criteria. These elements will be assessed based on documents submitted to the bank which normally include; a business proposal, financial statements, and other supporting documents.

*Character* - Character relates to the desirable ethical matters such as honesty, integrity and trustworthiness. It also refers to the willingness of the borrowers and determination to meet a loan obligation on time. Contrary to that, past defaults by borrowers indicate negligence or irresponsibility which are undesirable traits of character. Ideally, successful repayment from a borrower is due to good assessment of borrower's characteristics (Tadesse Gebremedhin, & Gebretinsae, 2010).

*Capacity* - Capacity is the ability of a borrower to repay the loan. This element concerns the borrowers' experience in the field of business and management skills, so the banks are assured the loan will be used well and be able to satisfy the loan application. The lender will scrutinize a borrower's application to decide whether the borrower has adequate liquidity to make a scheduled payment and continue to operate a business (Boushnak, Rageb, Ragab, & Sakr, 2018).

*Capital* - Capital represents the funds kept in the firm to cover unexpected losses. This factor is used to analyse a borrower's ability and capacity to carry out their daily business. Capital assessment involves deciding how much the lender or bank would receive if a company goes bankrupt or is liquidated (Turvey, He, Kong, Ma, & Meagher, 2011) Character, Capacity, Capital, Condition, Capability, and Collateral.

*Collateral* - Collateral refers to the asset or assets pledged to secure a loan. Collateral can be in the form of accounts receivable, inventory, equipment or real estate. This will help lenders to protect themselves from possible losses by requiring borrowers to secure a loan with collateral (Baiden, 2011).

*Condition* - Condition refers to a credit agreement requirement that relates to the rights and obligations of borrowers. Both borrowers and

lenders condition matters in credit decision making. For the borrower, the assessment of conditions under which the borrower operates can have a significant influence on credit quality. It will focus on the vulnerability of the borrower to shifting on conditions and ability to cope with the conditions. For the lender, the condition is based on changes in interest rate, credit risk, liquidity risk and credit policy of a bank (Baiden, 2011).

### *Behavioral factors in credit decision making*

In the irrational decision making perspective, the psychological approach to bankers lending decision making highlights the following gaps; (i) Loan officers demonstrate a number of psychological decision making biases; and (ii) Loan officers use intuition in addition to deliberation when making lending decisions (Trönnberg & Hemlin, 2012; 2014). On these premises, the following intuitive decisions and the associated behavioral biases seen in the context of bank decision making are reviewed.

*Intuition* - Intuition refers to when an individual may not rationally process all hard information and place importance on only a few (Rodgers, 1991) and rely on intuition for the rest. Intuition is a behavioural decision paradigm. Intuitive processing of information, which allows people to learn from experiences and reach perceptions of knowledge without a conscious effort. Credit officers use relational and heuristic bases to make decisions using soft information such as client relationships, company management skills, applicant experience, and applicant knowledge (Trönnberg & Hemlin, 2014). This is commonly referred to as subjective judgement, and may include intuition, impressions, and feelings (Baklouti & Bouri, 2014) or gut instinct (Carter, Shaw, Lam, & Wilson, 2007; Wilson, 2016) of credit officers. This is committed by credit officers as a way of behavioural indication of the trustworthiness of a client (Lipshitz & Shulimovitz, 2007).

*Loss Aversion* - Loss aversion refers to the overweighing of potential losses relative to equivalent gains, and a critical determinant of risky decision making (Sokol-Hessner & Rutledge, 2019). This behavioural bias in decision making has been shown to have a significant effect on the decision making of credit in banking institutions (Bacha & Azouzi, 2019). In particular, bankers' tendency for weighting high risks for new businesses, risky industry and insufficient business and financial information.

*Optimism* – Optimism bias is also known as individual tendancy to overestimate the likelihood of positive events, and underestimate the likelihood of negative events in the decision making process (Sharot, 2011). In lending practice, credit officers may overestimate the likelihood of positive events and underestimate the likelihood of negative events occurring to the business and the lending proposal they are assessing. This behavioural decision biases have been tested to be significant in influencing credit-decision making in banks. Optimist female bank managers are more conservative than male credit officers (Bacha & Azouzi, 2019). Optimism has a bad effect to bank credit quality since optimistic officers are more likely to make imprecise predictions (Baklouti, 2015).

*Overconfidence* – Overconfidence is defined as (a) overestimation of one's actual performance, (b) overplacement of one's performance relative to others, and (c) excessive precision in one's beliefs (Moore & Healy, 2008). Individuals with overconfidence bias have a propensity to hold inaccurate and deceptive assessment of their abilities, intellect, or talent. This behavioural decision biases have been tested to be significant in influencing credit decision making in banks. Overconfidence female bank managers are more conservative than male credit officers (Bacha & Azouzi, 2019). On a negative note, an overconfident officer is more likely to make inaccurate predictions (Baklouti, 2015).

### *Moderating roles of human capital factors in credit decision making*

Earlier evidence point to the fact that the use of intuition depends on organizational and situational factors (Trönnberg & Hemlin, 2012; 2014). On this ground, the human capital factor evidence is reviewed to understand their roles in bank lending decision making. In fact, human capital has long been a factor in influencing bank officer credit decision making (Bruns & Fletcher, 2008). Ideally, investing in human capital leads to rise in human performance. The development of specific human capital is achieved through training or experience that leads to the ability to adapt to a specific firm, work or task (Coff & Raffiee, 2015). The following evidence point to the possible role of the human capital factor which plays a moderating role in mitigating behavioural biases in lending decision making of bank credit officers.

*Financial education* - Credit officers with high numeracy skills are more effective in evaluating borrowers' credit risks. Financial education has been shown to improve both financial literacy and the quality of financial decisions. In addition, higher education levels will lead to higher levels of financial literacy (Xu & Zia, 2012). Financial literacy significantly affects a bankers' credit decision making (Bacha & Azouzi, 2019). However, high-educational managers may be more likely to engage in more aggressive corporate practices such as risky investment and delegation in the context of credit decision making in banking (Bacha & Azouzi, 2019).

*Credit experience* - Credit experience refers to a bank officer's credit analysis experience for SMEs lending. Experience is a personal factor that influences individual intention and behavior (Wakkee & Sleebos, 2015). Financial managers can differ in decision-making due to changes in the career experience of managers (Dittmar & Duchin, 2016). In the context of credit decision making in banks, the decision to lend is a process of interaction between the regulations and the experience of an officer (Fletcher, 1995). In this regard, credit officers with a lot of experience can benefit from their years of working in this field (Baklouti, 2015). It appears that experience and expertise tend to confer credibility on decision-making competence and encourage one to exercise intuitive judgements (Hensman & Sadler-Smith, 2011). In addition, credit officers who have given credit to SMEs successfully in the past are more willing to look into loan applications from entrepreneurs (Wakkee & Sleebos, 2015). In terms of behavioural decision biases, more experienced credit officers are better at resolving judgmental biases than inexperienced officers partly due to higher emotional intelligence (Baklouti, 2015).

*Emotional intelligence* - A person's general intelligence represents that individual's overall level of intellectual attainment and ability (Mayer & Geher, 1996). Emotional intelligence is defined as ''the capacity to accurately perceive, evaluate and express an emotion; the ability to access and/or develop feelings when facilitating a line of

thinking; the expertise to handle emotions and emotional knowledge; the ability to control one's emotions in order to foster emotional and intellectual development." (Mayer & Salovey, 1997). Emotional intelligence has been used in measuring borrowers' psychology characteristics to lending activities (Baklouti, 2014). Theoretically, emotional intelligence involves certain cognitive skills and is expected to mediate the effect of subjective judgment which is induced by behavioural decision and biases (Baklouti, 2015). In the context of this research, it is expected that credit officers with high emotional intelligence could minimize the influence of behavioral biases in their credit assessment and decisions.

## Conceptual Framework and Hypotheses

The following conceptual framework (Figure 1) illustrates the influence of fundamental and behavioural factors to bank officer credit decision for SME lending. The relationship is informed by the BRT which informs that decisions are made due to both rational and non-rational factors. The rational part is informed by the rational decision theory and the irrational part by the intuitive decision theory. The BRT has long been used in the realms of psychological decision making (Taylor, 1975). In addition, the human capital theory is referred to connect the ideas that behavioral biases can be minimized by using human capital factors. In the context of this research, the human capital factors are hypothesized to moderate the influence of behavioural factors on bank officers' credit decision for SMEs lending. The framework is in line with intuitive decision making in the banking industry as in Hensman and Sadler-Smith (2011).

The relationships depicted in the framework are hypothesized as follows. *Fundamental factors*; H1a: Character positively influences bank officers' credit decision for SMEs lending. H1b: Capacity positively influences bank officers' credit decision for SMEs lending. H1c: Capital positively influences bank officers' credit decision for SMEs lending. H1d: Collateral positively influences bank officers' credit decision for SMEs lending. H1e: Condition positively influences bank officers' credit decision for SMEs lending.

*Behavioural factors*; H2a: Intuition positively influences bank officers' credit decision for SMEs lending. H2b: Loss aversion negatively influences bank officers' credit decision for SMEs lending. H2c: Optimism positively influences bank officers' credit decision for SMEs lending. H2d: Overconfidence positively influences bank officers' credit decision for SMEs lending.

*Human capital factors;* H3a: Financial education mediates negatively/positively the influence of behavioural factors on bank officers' credit decision. H3b: Credit experience mediates negatively/positively the influence of behavioural factors on bank officers' credit decision for SMEs lending. H3c: Emotional intelligent mediates negatively the influence of behavioural factors on bank officers' credit decision for SMEs lending.

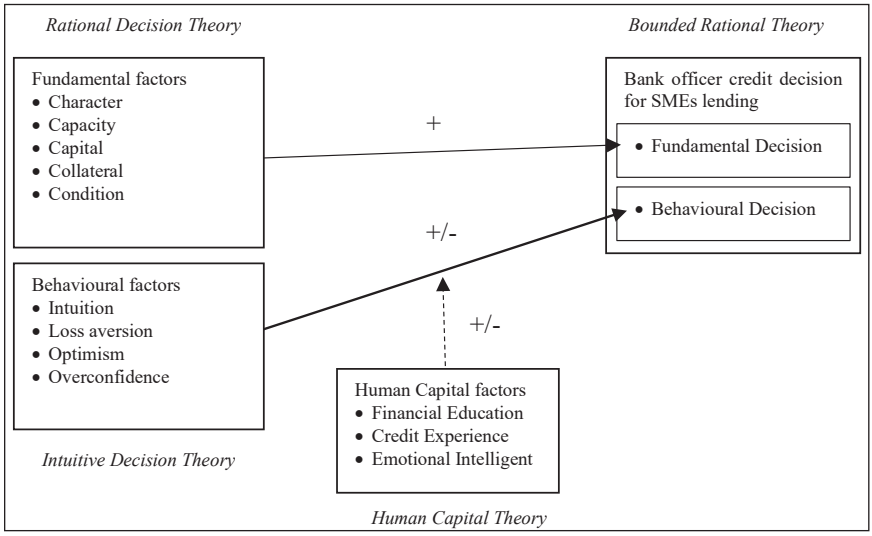


**Figure 1: Conceptual Framework of Bounded Rational Bank Officer's Credit Decision**

*Source*: Developed by the authors

## METHODOLOGY

The research started with conceptualization of the Bounded Rational Credit Decision Framework. This was designed based on review of three theories and related empirical evidence. In the second stage, constructs

and their measurement items were sourced from prior work. Thereafter, a questionnaire was developed. In the third stage, the validity of questionnaire was tested using expert validation, pre-test and pilot-test. The expert validation involved one academician in the area of questionnaire design. Pretesting was used to refine the questionnaire design and identify errors which may only be apparent to the population concerned (Reynolds, Diamantopoulos, & Schlegelmilch, 1993). Problems with survey questions may include; items that are misunderstood, items that cannot be answered, and items respondents will not answer (Collins, 2003). Pilot testing was undertaken to check the validity of the construct/items in the questionnaire using factor analysis (Artino, Jr. et al., 2014).

## FINDINGS

### Expert Validation and Pre Test

The questionnaire was vetted by an expert in the area of questionnaire design. After improvement, the questionnaire was pre-tested using real credit officer sample. The pre-testing of the questionnaire validity involved 10 bank officers, representing 5 banks (Affin Bank, Agrobank, Ambank, Hong Leong Bank, and Public Bank). To partly assess questionnaire validity, the following debriefing questions were provided to assess respondents' opinions; Was the survey engaging? (Yes = 10), How long did it take you to complete the survey? (Average = 12 minutes), Were there any confusing questions? (No = 10), and, Were there any areas of frustration? (No = 9). Based on this responses, there were no areas that needed to be improved. A summary of the construct/items incorporated in the questionnaire is provided in Table 1.

**Table 1: Constructs/Items Summary**

| Construct | No of Item | Reference |
|---|---|---|
| Dependent Variable | | |
| Fundamental Decision Making | 4 | Palazuelos et al. (2017) |
| Behavioural Decision Making | 5 | Scott and Bruce (1995) |
| **Fundamental Factor** | | |
| Character | 3 | Wasiuzzaman, Nurdin, Abdullah, and Vinayan (2020) |
| Capacity | 6 | Wasiuzzaman et al. (2020) |
| Capital | 6 | Wasiuzzaman et al. (2020) |
| Collateral | 5 | Wasiuzzaman et al. (2020) |
| Condition | 4 | Wasiuzzaman et al. (2020) |
| **Behavioural Factor** | | |
| Intuition | 5 | Hamilton, Shih, and Mohammed (2016) |
| Loss Aversion | 6 | Bacha and Azouzi (2019); Souissi and Jarboui (2018) |
| Optimism | 6 | Bacha and Azouzi (2019); Souissi and Jarboui (2018) |
| Overconfidence | 5 | Bacha and Azouzi (2019); Souissi and Jarboui (2018) |
| **Human Capital Factor** | | |
| Emotional Intelligent | 10 | Davies, Lane, Devonport, and Scott, (2010) |
| Financial education | Dummy variable | Author |
| Credit experience | Dummy variable | Author |

## Pilot Test

A total of 30 bank officers working in the business banking division of selected Malaysian local banks participated willingly in pilot testing the questionnaire. The selection of a minimum of 30 samples for a pilot test was based on the recommendation of Browne (1995). The pilot test intended to; develop and test the adequacy of research instruments, assess the feasibility of the survey, to assess if the research protocol was realistic, and assess whether the sampling frame and techniques were effective (van Teijlingen & Hundley, 2001).

The descriptive statistics of 30 respondents involved in the pilot study are summarized in Table 2. Table 3 provides the fundamental factor descriptive statistics. The mean and standard deviation scores were; character (mean 4.01, standard deviation of 0.78), capacity (mean 3.92, standard deviation 0.59), capital (mean 3.83, standard deviation 0.59), collateral (mean 3.83, standard deviation 0.61), and condition (mean 4.01, standard deviation 0.54). For the behavioural factors, the mean and standard deviations were; intuition (mean 3.14, standard deviation 1.01), loss aversion (mean 3.75, standard deviation 0.58), optimism (mean 3.68, standard deviation 0.42), overconfidence (mean 3.71, standard deviation 0.55). Table 3 also summarizsd the reliability test of the variables with the Cronbach's Alpha ranging from 0.75 to 0.95. Optimism had the lowest Cronbach's Alpha with 0.75 and character had the highest value rating at 0.95. Starting at 0.7 and above, the alpha coefficient indicated acceptable coefficient reliability (Nunnally, 1978). In addition, Cronbach's alpha ranging from 0.5 – 0.7 generally indicates moderate reliability while 0.5 and below indicates a scale of low reliability (Hinton, McMurray & Brownlow, 2004).

The Pearson correlation analysis reported in Table 4 (Panel A and B) was used to assess the relationship between the measures of the fundamental factors, behavioural factors and human capital factors for bank officers' credit decision for SMEs lending. As reported in Panel A, the pilot study showed that the results for collateral had the highest value of $r=0.485$ $n=30$, $p=0.007<0.05$, and followed by condition with $r=0.479$, $n=30$, $p=0.007<0.05$ and character with $r=0.409$, $n=30$, $p=0.025<0.05$ and capital with $r=0.363$, $n=30$, $p=0.049<0.05$. Therefore, it can be concluded that variables such as collateral, condition, character and capital had a significant relationship with the fundamental decisions making for SMEs lending. In Panel B, the pilot study showed that the results for intuition had the highest value of $r=0.898$ $n=30$, $p=0.000<0.05$, and after that followed by loss aversion with $r=0.734$, $n=30$, $p=0.000<0.05$ and overconfidence with $r=0.624$, $n=30$, $p=0.000<0.05$. It can be concluded that variables

such as intuition, loss aversion, and overconfidence had a significant relationship with behavioural decision making for SMEs lending. Overall correlation score for fundamental and behavioral variables were positively associated with credit officer decision making. This provides an earlier indication of the influence of both fundamental and behavioral factors to bank credit officers' decision making.

Lastly, Table 5 shows the results of Principal Component Analysis estimated with Promax rotation. A total of 12 constructs with 65 items validity were tested. A cut-off point of 0.40 was used for identifying significant factor loadings (Costello and Osborne, 2005). BEHAV5, CAPA2, CAPA3, CAPA4, CAPI4, CAPI6, LOSS3, LOSS5, LOSS6, OPT1, OPT3, OVERC5, EMO1, EMO2, EMO7, EMO8 and EMO9 (17 items) were dropped due to either high cross-loadings or low factor loadings as suggested by (Igbaria, Iivari & Maragahh, 1995). Next, the communalities were determined for each item. The communalities of the itemsranged from 0.727 to 0.967. According to (Hair et al. 2010), communalities should be 0.5 or greater to get a better measurement of factorial and principal component analysis. As a conclusion, the retained 48 items were confirmed to be valid constructs to be used for further empirical test.

**Table 2: Descriptive Statistic of The Respondents**

| Variable | | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 14 | 46.67% |
| | Female | 16 | 53.33% |
| Age | 20-30 years old | 6 | 20% |
| | 31-40 years old | 18 | 60% |
| | 41-50 years old | 6 | 20% |
| Qualification | High School | 1 | 3.33% |
| | Diploma | 4 | 13.33% |
| | Bachelor | 23 | 76.67% |
| | Master | 1 | 3.33% |
| | PhD | 1 | 3.33% |
| Education Major | Finance | 9 | 30% |

| Variable | | Frequency | Percentage |
|---|---|---|---|
| | Accounting | 4 | 13.33% |
| | Business Admin | 12 | 40% |
| | Other | 5 | 16.67% |
| SME credit experience | Less than 5 years | 8 | 26.67% |
| | 6-10 years | 15 | 50% |
| | 11-15 years | 4 | 13.33% |
| | More than 15 years | 3 | 10% |
| Bank | AgroBank | 8 | 26.67% |
| | SME Bank | 5 | 16.67% |
| | Affin Bank | 4 | 13.33% |
| | Ambank | 1 | 3.33% |
| | CIMB Bank | 1 | 3.33% |
| | Hong Leong Bank | 1 | 3.33% |
| | Maybank | 8 | 26.67% |
| | Public Bank | 1 | 3.33% |
| | RHB Bank | 1 | 3.33% |
| Location of the bank | Kuala Lumpur | 1 | 3.33% |
| | Labuan | 1 | 3.33% |
| | Melaka | 1 | 3.33% |
| | Pahang | 2 | 6.67% |
| | Pulau Pinang | 1 | 3.33% |
| | Sabah | 17 | 56.67% |
| | Sarawak | 6 | 20% |
| | Selangor | 1 | 3.33% |
| Job function | Credit analysis | 16 | 53.33% |
| | Credit marketing | 13 | 43.33% |
| | Credit Admin | 1 | 3.33% |

***Notes*:** The respondents are working with 9 banks operating in Sabah and Labuan –Agrobank, Affin Bank, Ambank, CIMB Bank, Hong Leong Bank, Maybank, Public Bank, RHB Bank, and SME Bank . N = 30 respondents.

**Table 3: Descriptive Statistics and Reliability Test**

| Factor | No of item | Descriptive Statistics | | Reliability Test |
|---|---|---|---|---|
| | | Mean | Standard Deviation | Cronbach Alpha |
| Dependent Variable | | | | |
| Fundamental Decision | 4 | 4.0167 | 0.48215 | 0.779 |
| Behavioural Decision | 5 | 3.4467 | 0.87207 | 0.900 |
| **Fundamental Factor** | | | | |
| Character | 3 | 4.0111 | 0.78532 | 0.957 |
| Capacity | 6 | 3.9278 | 0.59802 | 0.889 |
| Capital | 6 | 3.8389 | 0.59126 | 0.866 |
| Collateral | 5 | 3.8333 | 0.61719 | 0.906 |
| Condition | 4 | 4.0167 | 0.54903 | 0.866 |
| **Behavioural Factor** | | | | |
| Intuition | 5 | 3.1400 | 1.01322 | 0.950 |
| Loss Aversion | 6 | 3.7500 | 0.58844 | 0.866 |
| Optimism | 6 | 3.6889 | 0.42601 | 0.759 |
| Overconfidence | 5 | 3.7133 | 0.55754 | 0.832 |
| **Human Capital Factor** | | | | |
| Emotional Intelligent | 10 | 3.8933 | 0.40338 | 0.779 |

***Notes:*** This table provides summary of the Cronbach Alpha score for the respective constructs. N = 30 respondents.

**Table 4: Pearson's Correlation Tests**
**Panel A: Fundamental decision making components**

| | Character | Capacity | Capital | Collateral | Condition | Fundamental Decision |
|---|---|---|---|---|---|---|
| Character | 1 | | | | | |
| Capacity | 0.752** | 1 | | | | |
| Capital | 0.722** | 0.865** | 1 | | | |
| Collateral | 0.677** | 0.570** | 0.674** | 1 | | |
| Condition | 0.673** | 0.765** | 0.703** | 0.578** | 1 | |
| Fundamental Decision | 0.409* | 0.353 | 0.363* | 0.485** | 0.479** | 1 |

**Panel B: Behavioural decision making components**

| | Intuition | Loss Aversion | Optimism | Overconfident | Behavioural Decision |
|---|---|---|---|---|---|
| Intuition | 1 | | | | |
| Loss Aversion | 0.735** | 1 | | | |
| Optimism | 0.325 | 0.665** | 1 | | |
| Overconfident | 0.550** | 0.727** | 0.497** | 1 | |
| Behavioural Decision | 0.898** | 0.734** | 0.347 | 0.624** | 1 |

***Notes**:* This table provides summary of the correlation score among the respective constructs. N = 30 respondents.
*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

**Table 5: Factor Analysis**

| Variable | Items | Loadings | Communalities |
|---|---|---|---|
| **Credit decision for SMEs lending** | | | |
| **Fundamental Decision Making:** *In general, SMEs that possess good 5Cs;* | | | |
| FUN1 | Have a high probability that the bank makes a positive assessment on their overall position. | 0.459 | .825 |
| FUN2 | Have a high probability that the banks feel predisposed to work with them. | 0.797 | .881 |
| FUN3 | Have a high probability of getting funding. | 0.957 | .890 |
| FUN4 | Have a high probability that banks want to established long-term relationships with them. | 0.518 | .867 |
| **Behavioral Decision Making:** *When making credit analysis;* | | | |
| BEHAV1 | I trust my inner feelings and reactions. | 0.534 | .910 |
| BEHAV2 | I generally make credit decision that feel right to me. | 0.546 | .893 |
| BEHAV3 | I rely upon my instincts. | 0.665 | .865 |
| BEHAV4 | It is more important for me to feel the credit analysis is right than have a rational reason for it. | 0.637 | .844 |
| BEHAV5 | I tend to rely on my intuition | ** | |

| | | | |
|---|---|---|---|
| **Company fundamental factor** | | | |
| **Character** | | | |
| CHAR1 | Firm has good past payment record. | 0.750 | .967 |
| CHAR2 | Firm has never defaulted loan payment. | 0.742 | .949 |
| CHAR3 | Firm's owners have never defaulted on their personal loans. | 0.724 | .963 |
| **Capacity** | | | |
| CAPA1 | Firm is able to handle debt capacity. | 0.818 | .873 |
| CAPA2 | Firm has successfully managed loan commitments in the past. | ** | |
| CAPA3 | Firm has other assets that can be liquidated. | ** | |
| CAPA4 | Firm is able to repay debt. | ** | |
| CAPA5 | Firm's owners have manageable personal financial commitment. | 0.732 | .873 |
| CAPA6 | Firm has strong cash flows and financial viability. | 0.911 | .867 |
| **Capital** | | | |
| CAPI1 | The owner(s) have invested a large amount of capital (financial commitment) in the firm. | 0.769 | .871 |
| CAPI2 | The firm cash flows are adequate. | 0.934 | .940 |
| CAPI3 | The firm record shows strong past earnings, dividends, and sales. | 0.962 | .858 |
| CAPI4 | The firm has adequate liquid reserves. | ** | |
| CAPI5 | The firm has high turnover of payables, account receivables and inventory. | 0.792 | .845 |
| CAPI6 | The firm has good control over expenses. | ** | |
| **Collateral** | | | |
| COLL1 | The liquidation value of the firm assets are high. | 0.636 | .826 |
| COLL2 | The firm assets require a low degree of specialisation. | 0.493 | .896 |
| COLL3 | Encumbrances and restrictions against the firm properties held are low. | 0.514 | .801 |
| COLL4 | Leases and mortgages issued against property and equipment are small. | 0.668 | .901 |

| | | | |
|---|---|---|---|
| COLL5 | Guarantees and warranties issued to others are small. | 0.893 | .900 |
| **Condition** | | | |
| CON1 | The firm business has growth potential. | 0.650 | .925 |
| CON2 | There is a huge demand for the firm products. | 0.724 | .727 |
| CON3 | The firm product will remain relevant and feasible in the future. | 0.657 | .920 |
| CON4 | The industry outlook for the firm's business is good in the long run. | 0.529 | .731 |

***Notes*:** a. Item with asterisk mark (*) indicates item has been dropped due to lower loadings with cut-off point <0.4.
b. Item with asterisk mark (**) indicated item has been dropped due to higher loadings (>1).

**Table 5: Factor Analysis (Continue)**

| Variable | Items | Loadings | Communalities |
|---|---|---|---|
| **Behavioural factor** | | | |
| **Intuition** | | | |
| INTUI1 | When making decisions, I rely mainly on my gut feelings. | 0.952 | .853 |
| INTUI2 | My initial hunch about decisions is generally what I follow. | 0.874 | .899 |
| INTUI3 | I make decisions based on intuition. | 0.965 | .853 |
| INTUI4 | I rely on my first impression when making decisions. | 0.989 | .960 |
| INTUI5 | I weigh feelings more than analysis in making decisions. | 0.967 | .949 |
| **Loss aversion** | | | |
| LOSS1 | Even in those cases when success is not taken for granted, I would make an attempt to achieve it. | 0.492 | .843 |
| LOSS2 | I have a comprehensive insurance coverage. | 0.403 | .784 |
| LOSS3 | My decisions are always taken with great care and precision. | * | |
| LOSS4 | In financial contexts, the word «risk» signifies «danger» | 0.489 | .790 |
| LOSS5 | I would take challenging decisions once I feel sure of the targeted results. | * | |
| LOSS6 | I usually try to predict the negative results likely to emanate from my acts. | * | |

| | | | |
|---|---|---|---|
| **Optimism** | | | |
| OPTI1 | I foresee the upcoming life events positively. | ** | |
| OPTI2 | I plan to contribute with accomplishments that would sound greater than the average achievements. | 0.701 | .899 |
| OPTI3 | In general, I would feel really optimistic whenever I have to decide for something important. | ** | |
| OPTI4 | I feel pessimistic with regard to the bank's internal status. | 0.855 | .852 |
| OPTI5 | The surrounding bank managers appear to have an effective needs' analysis. | 0.893 | .909 |
| OPTI6 | I feel confident as to my colleagues' estimations. | 0.619 | .823 |
| **Overconfidence** | | | |
| OVERC1 | My file assessments prove to be accurate. | 0.936 | .913 |
| OVERC2 | I think I can anticipate customers' deception. | 0.778 | .889 |
| OVERC3 | It is easy to pay particular attention to my objectives and accomplish my goals. | 0.454 | .905 |
| OVERC4 | I feel rather intelligent with respect to the majority of my colleagues. | 0.464 | .825 |
| OVERC5 | My colleagues take me for a good Credit Officer. | * | |
| **Human capital factor** | | | |
| **Emotional intelligent** | | | |
| EMO1 | I know why my emotions change. | * | |
| EMO2 | I easily recognize my emotions as I experience them. | * | |
| EMO3 | I can tell how people are feeling by listening to the tone of their voice. | 0.894 | .834 |
| EMO4 | By looking at their facial expressions, I recognize the emotions people are experiencing. | 0.699 | .807 |
| EMO5 | I seek out activities that make me happy. | 0.726 | .855 |
| EMO6 | I have control over my emotions. | 0.906 | .960 |
| EMO7 | I arrange events others enjoy. | ** | |
| EMO8 | I help other people feel better when they are down. | ** | |
| EMO9 | When I am in a positive mood, I am able to come up with new ideas. | ** | |
| EMO10 | I use good moods to help myself keep trying in the face of obstacles. | 0.597 | .765 |

***Notes:*** a. Item with asterisk mark (*) indicates item has been dropped due to lower loadings with cut-off point <0.4.
b. Item with asterisk mark (**) indicated item has been dropped due to higher loadings (>1).

# DISCUSSION

## Behavioural Biases in Bank Lending Practices

Many of the financial practices including bank lending decisions are motivated by modern finance-based theories and ideologies. From the behavioral finance perspective, given the complex nature of human behavior, purely rational decision making would be sub-optimal given behavioral forces impacting credit officers' decision making (Trönnberg & Hemlin, 2012; 2014) and consequently impacting banks' credit portfolio quality and credit market behaviours. There is a long list of behavioral biases and Asians suffer from behavioral biases more (Kim & Nofsinger, 2008). However, they are still uncovered in banking practices. The limited evidence highlighting that intuition (Lipshitz & Shulimovitz, 2007; Trönnberg, and Hemlin, 2014), loss aversion (Bacha & Azouzi, 2019), optimism (Baklouti, 2015; Bacha & Azouzi, 2019), and overconfidence (Baklouti, 2015; Bacha & Azouzi, 2019) influence bank credit officers' decision making. So far, bounded rationality in credit officers' decision making has been neglected in bank lending practices and policies. This may have serious repercussions. From the credit officer side, due to the influence of behavioural biases in their decision making, they may wrongly reject/approve a good/bad credit proposal (D'Angelo et al., 2018). This is possibly contributing to the problem of high rejection rate of SMEs financing applications and high non-performing loans of SME financing in which the rational-based bank operating procedures and decisions undermine the role of behavioral factors.

## Contributions

With reference to the Behavioral Finance Theory and evidence, this research contributes to the extension of the bank credit decision making for SMEs financing in the following ways. First, through development of a new bounded rational credit officer decision framework that takes into account both rational and irrational factors influencing their decision for SMEs financing. In addition, the role of

human capital to minimize the influence of behavioral biases on bank credit officers' decisions has been incorporated. Second, through the development of behavioral biases constructs and measurement items as well as the bounded-rational credit officer decision construct and measurement items that can guide banks in identifying and measuring behavioral biases on part of the credit officers.

### Practical Implications

The Bounded Rational Framework for bank credit officer decision making for SMEs lending is important for bank lending practices in the following contexts. At the individual level, the framework provides a way to recognize behavioral biases in individual officer lending decision making. In addition, it provides a way to take corrective actions through strengthening human capital defense against the over influence of behavioral biases in credit officers' decisions and actions. At the organizational level, the framework will support the needs for banking organizations to establish behavioral policies to govern behavioral biases in bank lending practices. This is possible through incorporation of operational control mechanisms to mitigate the influence of behavioral biases in bank lending decisions and consequently improving bank credit decision making and credit portfolio quality.

## CONCLUSIONS

This paper developed a new conceptual framework of bounded rational bank officer's credit decision and developed a questionnaire based on the conceptual framework. A preliminary assessment of the measurement items for the behavioral biases constructs in bank lending decisions was validated by involving credit officers working in a business banking division of local banks in Malaysia. This study provides an extension to the behavioural finance approach in SMEs lending that would provide new insights to Malaysian banking practices and valuable for SMEs financing policy making in the Malaysian context. Understanding the behavioural finance approach in SMEs lending may lead to an effort for better decision-making by bank credit officers in assessing SMEs loan application. Theoretically, intuitions, loss aversion, optimism and overconfidence are the main behavioural biases

that were found to be influencing irrational lending decisions made by credit officers. The validity of the conceptual framework in bank lending practices is subject to be tested empirically. This will be the next part of this research project.

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