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Theory of Boundedly Rational Planned Behavior: A New Model

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Abstract: *The prime intent of this article is to propose a new model in the paradigm of behavioral and business economics. To attain this objective, the study modifies a famous behavioral model of the Theory of Planned Behavior (TPB), which is based on the generalized unbounded rationality of neoclassical economics in dictating actual human behavior. Based on the idea of bounded rationality expounded by Herbert A. Simon, TPB has been modified by replacing intention variable with bounded rationality as the antecedent of actual behavior. The new model has been tested collating data collected from the participants of a Microfinance Institute currently operating in Bangladesh. Data were analyzed following the procedure of structural equation modeling (SEM). The findings of the experiment show that the new model of TBRPB's predictability is observed to be much better than TPB which may be regarded as a basic contribution to the existing body of knowledge.*

Keywords: Bounded rationality; Bounded self-interest; Bounded willpower; TPB; TBRPB

JEL Classification: E7, E70, E71

Introduction

By definition, economics is a behavioral science which is eloquently delineated by Marshall (1920), Robins (1935) and Mullianathan and Thaler (2000). This could include the behavioral studies of consumers, producers, investors, borrowers and also micro-borrowers such as microfinance consumers for whom many microfinance institutions now provide different customized banking services. This means that human rationality and behavior are brilliantly subjective in nature and thus consumer behavior particularly is influenced by various elements of culture, social class, family and personal. It is also influenced by diffusion of innovations related to product's quality, shape or look, different features and above all its overall brand

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image, and individual determinants, such as learning and memory of individuals, personality and self-concepts, individual attitudes, motivation and involvement and individual ability to process information (Loudon Bitta, 2006). Thus, this rationality is essentially bounded by the aforementioned and untold other numerous influences which guide actual purchase behavior of individual consumer. In similar fashion, the rationality of other economic agents may have similar or different influences to form their respective actual behavior in their own domains.

However, in mainstream economics, it is assumed that that people generally make logical decisions in terms of maximizing individual utilities and business profits ensuring competitive market place to generate market efficiency and well-being, because it is a utilitarian, rationalist and individualist paradigm (Etzioni, 1990, 2011). In several cases, these assumptions were ended in illogical and irrational outcomes and thus were criticized as unrealistic, unproductive and amoral (Parsons, 1937; Allvine Tarpley, 1977; Thurow, 1980; Wilber Jameson, 1983). One of such examples is the financial market crash in the fall 2008 in the United States which did not work as rational expectation. Having witnessed this massive financial downturn, Alan Greenspan, the former chairman of the U. S. Federal Reserve once known as, "the greatest banker who ever lived," remarked in the Congress that markets did not function according to his lifelong expectations. He lamented as saying that he had "made a mistake in presuming that the self-interest of organizations, specifically banks and others, was such that they were best capable of protecting their own shareholders" (Ariely, 2009, 78). Hence, we now need to have an alternative paradigm which can rectify all these malaises of mainstream neoclassical economic theory. In this respect, the emerging field of behavioral economics can be of rightly pragmatic choice (Etzioni, 2011, Wolman and Colamosca, 1997).

Behavioral economics is established on the premise that "human beings are fundamentally irrational and motivated by unconscious cognitive biases. This emerging discipline offers a radically different view about the ways people and organizations really operate" (Ariely, 2009, 80). In this way, it is nothing looked odd that many of the factors such as ethics, values, and judgments can affect the rationality and behavior of the economic agents and that should be put within the models of economic analysis to predict the outcome in a meaningful way which can, in effect, pave the building block of the new castle of boundedly rational behavioral economics.

The specific intent of this paper is, however, to restructure Ajzen's (1991) theory of planned behavior (TPB) which is based on generalized rationality assumption of mainstream neoclassical economics. In so doing, in the new theory of boundedly rational planned behavior (TBRPB) we replace the universal rational intention variable of TPB by subjective or boundedly rational intention which influences the actual behavior of economic agents keeping all other three explanatory variables unchanged. Thus, by adopting an experimental approach collating field data with it, the present paper rediscovers the truth underlying the assumptions of rationality

toward actual behavior of customers and employees leading to constructing a new model of economic behavior.

Behavioral Economics and Bounded Rationality: An Overview

The term *behavioral economics* is associated with the pioneering work of George Katona (1967). However, behavioral economics has been seen as an emerging field of economics just with the seminal work of Herbert Simon's bounded rationality concept that conjoined economics and psychology in one platform in order to provide with theories (Rabin, 1998), which are more realistic and tied to experimental and field data (Berg, 2010). Though different authors have variously defined behavioral economics, there is one thing in common that tells behavioral economics as a research program aimed to reunifying psychology and economics (Camerer, 1999; Berg, 2010; Bruni and Sugden, 2007). This tradition was broken sporadically in the paradigm of neoclassical economics by Slutsky (1915/1952), Friedman (1953) and Sen's "Rational Fools" (1977). These juggernauts of neoclassical economics were countered by Simon (1986a), who put forward his new idea of economic decision-making process within economic organizations and coined the term *bounded rationality* bringing behavioral economics to the fore front of discussions.

As the term *bounded rationality* is embedded in the rubrics of behavioral economics, this subfield of economic science has been rejuvenated once again with the winning of Nobel Prize by Herbert Simon in 1978. By the term bounded rationality, it means to put limits or bounds on three thematic aspects: *self-interest, rationality or information processing capability* and *willpower of human beings* held in the pursuit of behavioral Economics. Now let us have a closer look at those three guiding themes briefly in behavioral economics model one by one.

Bounded Self-interest

Individual self-interest is not always unbounded (Ariely, 2009). Say for example, societal preference of an economic agent. In society, there are so many people who used to prefer to practice purely societal and altruistic exercises. For evidence, in 1993, 73.4 percent of the households donate some money to charitable purposes accounting 2.1 percent of total household income and 47.7 percent of the population does volunteer work with an average of 4.2 hours per week (Mullianathan and Thaler, 2000). Similar selfless behavior is also observed in the closed environment of the laboratory in carrying out scientific experiments which are truly for altruism (Mullianathan and Thaler, 2000). That means, a person with societal preference might be happier when a person prefers allocations in which the sum of all people's payoff is maximized and

it is described as a preference for social welfare. This violates the common neoclassical economics assumption that people are infinitely self-interested because it implies that people remain sometimes indifferent so long as their own material payoffs are held constant (Berg, 2010). Hence, an economic man is not always selfish rather is observed sometimes as relatively selfless, altruistic and dedicated for contributing something for the betterment of society (Charness and Grosskopf, 2001).

Bounded Rationality

Empirical research has shown that the fully functioning individual whose processing capability of available information mediates the effects of biological and environmental factors on behavior (Ajzen, 1991) The capacity of human being in processing information is finite regarded to be held in behavioral economics in contrast to be infinite held in neoclassical economics (Simon, 1955). Varied elements of human capability include limited memory, limited attention, limited perceptual capacity, distorted or crooked beliefs and decision and inference processes that violate pure logic and probability theory (Berg, 2010; Camerer, 2003). To deal with limited brain power and time, people use mental shortcuts and rules of thumb. In these cases, human behavior differs in systematic ways from that predicted by the neoclassical economic model of unbounded rationality (Jolls, Sunstein and Thaler, 1998). Hence, the assumption of unlimited capability of processing information and solving optimization problem of rational man is subjective and bounded which violates the tenets of standard mainstream economics. Very often this irrationality or one may term as bounded rationality can be incorporated into a model as an antecedent toward actual behavior as people's habit of choosing goods with an end toward minimizing changes in their consumption (Arrow, 1950). This fact has been reflected in our new model of the bounded rational behavior.

Bounded Willpower

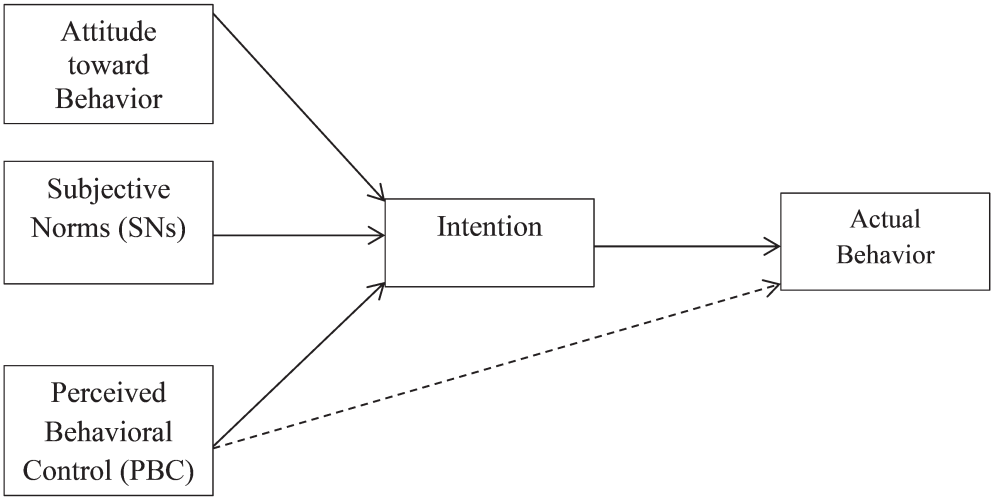
It is another important and growing area of research interests within behavioral economics. This very topic of bounded willpower is often described as time or dynamic inconsistency (Berg, 2010). By the term of bounded willpower, it means that people's will power is finite or limited. For this reason, when people plan to take some actions, they put a backup plan to complete that plan of action. For instances, many smokers plan to stop smoking and pay money to join a rectifying program that helps them quit. Sometimes people join a pension plan to save some money for their retired life to prevent under-saving. Also people often do not keep tasty deserts in- house refrigerator when they plan to go on diet (Jolls et al., 1998). All these happened mainly

because their willpower is bounded or limited which is contrary to the neoclassical assumption.

TPB and TBRPB

The Theory of Boundedly Rational Planned Behavior (TBRPB) is a simple modification of the Theory of Planned Behavior (TPB) devised by Ajzen (1991) (see Figure 1), which is an extension of the Theory of Reasoned Action (TRA) originated by Fishbein and Ajzen (1981).

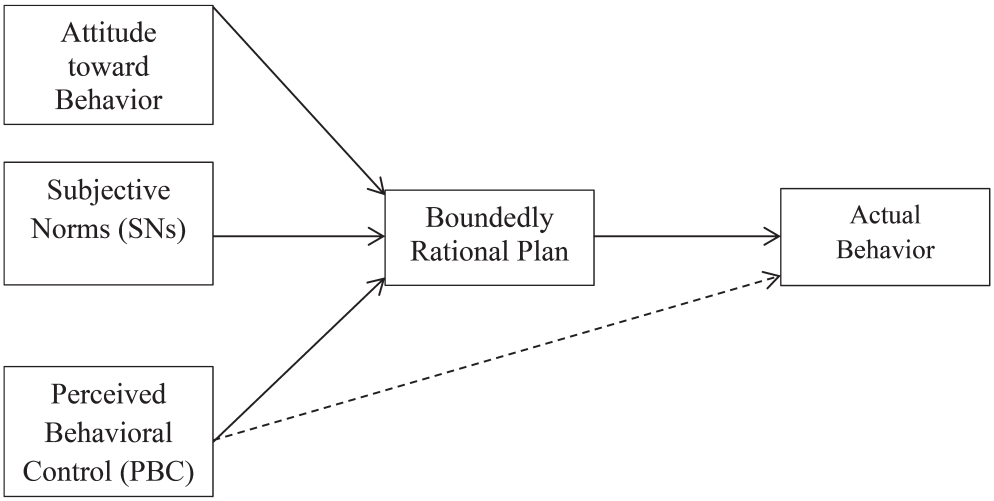
Figure 1: Theory of Planned Behavior (TPB)



Source: Ajzen (1991)

As mentioned earlier, conventional economic analysis generally proceeds under the assumptions of neoclassical economics that all human beings behave as supposed by the infinitely rationality notion of rational man. In similar fashion, TPB assumes that rational considerations govern the choices and behaviors of individuals (Ajzen, 1985; Ajzen, 1991; Ajzen and Fishbein, 2005). However, empirical evidence suggests that there is enough reason to doubt these assumptions on the grounds that people exhibit bounded self-interest, bounded rationality and bounded willpower (Simon, 1986a; Simon, 1986b; Jolls et al., 1998; Ariely, 2009) which provide practical guiding limits toward actual behavior as direct antecedents of this actual behavioral construct in the model of TBRPB (see Figure 2).

Figure 2: Theory of Boundedly Rational Planned Behavior (TBRPB)



It is our conjecture that this model, when coupled with a few modifications in the existing assumptions and in the replacement of the infinite rational intention construct with bounded rational choice, can generate some more fascinating and powerful analytic and predictability of individual human behavior. Based on this understanding, generalized rational intention used in TPB has been replaced by the boundedly rational plan as the direct antecedent of actual behavior in TBRPB.

Boundedly Rational Plan

Based on the logics put forward by Herbert Simon (1986), we replaced generalized unbounded intention variable of TPB pioneered by Ajzen (1991) by boundedly rational plan. As mentioned earlier, Ajzen (1991) constructed his model based on universal assumption of neoclassical economics that every individual human being is infinitely rational in all the circumstances. We refuted this notion based on the arguments advanced by Simon (1986). As behavioral economics is another field of economics and its goal to strengthen the predictive and analytic power of economics which does not suggest that behavior is random or impossible to predict, rather it suggests that behavior is systematic and can be modeled (Jolls et al., 1998). One of the arguments is that action is presumed to be consequential rather than calculated (March, 1978). This means that "systematic rationality is not intentional" (March, 1978, p.593). Thus, every human being performs actual behavior based on the subjective and bounded rationality which is bounded with its end (March and Olsen, 1976). Hence, it is highly logical to take this construct of boundedly rational plan of choice to predict and analyze the actual behavior of an economic agent to its highest level.

According to Simon (1955), there are at least three factors that influence individual rationality toward actual behavior: (i) Rationality requires complete knowledge and understanding of the consequences of a given action; (ii) Given that consequences of actions, it is difficult for decision-makers to fully evaluate the future worth of their decisions. For this reason, other social actors such as family members or friends can influence individual's boundedly rational plan toward a particular behavior and this can be termed as subjective norms (SNs); and (iii) Rationality requires that all alternative actions are known. In actual decision-making processes, very few alternatives are known, which inhibits humans in making optimum decisions. This implies that controls in any of the alternative actions are instrumental to rationality toward any particular behavior. Thus, these three variants are, thus, important to consider putting an influence on rationality of an individual toward an actual behavior.

Rationale for Retaining Attitude, SNs and PBC in the Model

Decision-makers might plausibly be influenced by several factors, since they will primarily base their decisions on readily available data and knowledge and not be able to incorporate unknown data or knowledge into their decision-making. This incomplete data or knowledge forms subjective attitudinal belief of human beings and limits the ability of rationalization in decision toward particular activity. Thus, these factors influence to form particular attitudinal belief of individuals which impacts on individual subjective rationality. This implies that attitude toward behavior can be retained as one of the antecedents of limited rationality toward actual behavior idealized originally by Fishbein and Ajzen (1981) in their theory of reasoned action (TRA).

Since humans are not able to act fully rational, Herbert A. Simon proposes that organizations should develop clear organizational goals for employees to follow. These goals should act as the value premises that underlie daily decision-making. The value premises should communicate what ends are preferred or desirable to the organization, and clearly distinguish between what is acceptable from unacceptable. This idea can be interpreted as normative value premise which can constitute the different social pressure based on the respective normative structure. Hence, the model can retain subjective norm as the second antecedent originally structured by Fishbein and Ajzen (1981) in their model of TRA without losing any predictive credibility of the model.

Formalized control mechanisms like routinization, specialization, training, standard procedures, normally found in formalized organizational structures, can also be seen as a support for rational decision giving the individual employee of the mental capacity to perform more rational decisions. This means that individual control over the decision making process to formalize individual rationality toward performing an action is another factor that can have an influence on actual behavior. This factor can be interpreted as the perceived behavioral control (PBC) that was originally conceptualized and added by Ajzen (1991) in TRA and adapted the model as TPB.

Thus, the new model of the theory of boundedly rational planned behavior (TBRPB) along with its path variables showing their respective antecedents has been provided in Figure 2.

Attitude

The concept of *attitude* occupies a favored position in social psychology (Ajzen and Fishbein, 2005). Social psychologists are not, however, unanimous in their opinion in a precise definition of an attitude. As a matter of fact, there have been myriads of different definitions of the concept (Fishbein, 1966). According to Fishbein (1967), a person's overall attitude toward an object is a function of the strength of each of a number of beliefs the person holds about various aspects of the object and the evaluation s/he attaches to each belief as it relates to the object (Loudon and Bitta, 2006). This belief is, of course, the result of available information and accumulated knowledge about behavior (Simon, 1955). Obviously, the definition connotes attitude as being multidimensional rather than one-dimensional taken by earlier definitions which has been supported by Allport (1935).

Thus, it is clearly understood that the preceding section that all attitudes are ultimately developed from human needs and the values people place upon certain objects that satisfy those perceived needs. There are several sources from which a person may develop the attitudes toward objects that satisfy her or his needs. Among the sources, personal experience, group associations and influential others are the most prominent that are primarily spontaneous to shape an attitude toward certain object.

Subjective Norms

This construct is prescriptive in nature which advises on possible outcomes of a particular decision making process about an action. This implies what an individual should do or should not do; what is desirable or not desirable. One of the important factors is uncertainty that inhibits an individual to make perfect guess about future consequences. One of Simon's contributions to the theory of choice was his challenge of the self-evident proposition that choice behavior necessarily would be improved if it were made more like the normative model of rational choice (March, 1978). For this reason, Simon's bounded rationality has become widely recognized, as an accurate portrayal of behavioral choice and as a normatively sensible adjustment to the costs and extent of information collecting and processing by human beings (Radner and Rothschild, 1975; Connolly, 1977).

However, according to Fishbein and Ajzen, (1975), this is a function of normative belief as well as motivation to comply with the normative belief. A normative belief is the perceived expectation of important others such as friends, parents, spouses,

siblings, teachers, colleagues, managers, religious or political leaders of a person toward the particular object of behavior. Motivation to comply may either be real or imagined pressure one feel for one's behavior to match the perceived expectations of those important others in one's particular social environment. This social pressure is important, because a person's rationality toward any object of behavior can be significantly influenced either positively or negatively.

Perceived Behavioral Control

Control measure is another factor, according to Herbert Simon (1955), to materialize the choice of actual behavior. However, there have been some salient beliefs, according to Ajzen (1991), that finally determine an action that deals with the presence or absence of requisite resources and opportunities which are referred to as control beliefs. Ajzen (1991, p.196) says in this respect:

> "These control beliefs may be based in part on past experience with the behavior … The more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behavior."

As of today, a large number of studies have examined the relationship between specific control beliefs and PBC (Ajzen and Madden, 1986; Ajzen, 1991; Biddle and Nigg, 2000; Courneya and Bobick 2000; Armitage and Christian 2003; Rivis and Sheeran 2003). These researchers find that there is a strong correlation between PBC and the particular behavior and agreed that TPB represents the most compelling and well-established model for the prediction of rightly chosen behavioral option. Similar findings are shown by Rivis and Sheeran (2003) who put forward that TPB has been successfully accommodates the PBC construct and proven to be the most influential theory for predicting social and individual behavior. More specifically, Rhodes, Jones and Courneya (2002) point out that PBC is the specific strength of TPB which is the most validated and prominent social cognitive theories for understanding and explaining human behavior.

Thus, as like as beliefs regarding consequences of a behavior are taken as determining attitudes toward the behavior, and normative beliefs are taken as determining SNs, so beliefs about resources and opportunities are also taken as underlying PBC. Relating this fact, the current model of TBRPB has retained the same formulations of TPB as important antecedents of finite or bounded rationality to choose the right options of behavioral activities among many of such activities.

In the next section, we have delineated a case study of an Islamic microfinance institute, RDS located in Bangladesh to check the cohesions between different constructs of the new theory, TBRPB. We have selected this case of RDS, because the rationality toward participation in Islamic microfinance scheme is somewhat

different from the participation behavior observed in conventional MFIs. As RDS is an Islamic microfinance institution, it used to administer its micro-lending operation based on profit and loss sharing system discarding interest-based system. In this case, the choice and rationality of the borrowers is under their own discretion to decide whether they will participate in it or not. Thus, this case study adequately fits the new model to test employing filed level data.

Empirical Findings

A Case Study of Participation in Rural Development Scheme

The Rural Development Scheme (RDS) is the first full-fledged Islamic Microfinance Institute (IMFI) in the nation, a sister concern of the Islami Bank Bangladesh Limited (IBBL). RDS was established in 1995 in Bangladesh and it aims to develop the rural economy by solving problems related to underemployment and unemployment, and to establish model villages that are gradually freed from widespread poverty and destitution. It promotes overall development of the poor people towards transforming them as self-reliant through improving the socio-economic conditions of the poor, landless labor class and the marginal farmers. RDS is not a microfinance institute by itself, but uses the infrastructure and branch network of its parent organization, IBBL for its microfinance operations spread all over rural Bangladesh. Though there have been some other Islamic microfinance institutes (IMFIs) such as Al-Falah, Noble, and Rescue, they are not full-fledged microfinance organizations. In fact, they are regionally bounded and their activities are partially focused on the option of microfinance borrowing operations. Based on the theory (TBRPB), the following research model has been constructed to test the different hypotheses postulated in the model.

Theory and the Constructs of Microfinance Participation

In relation to the theoretical framework, it postulates that only a small number of components explain the TBRPB (see Figure 2) and they can be used to predict, explain and influence human behavior in applied settings. This simple nature or the parsimonious structure of the theory makes the TBRPB more attractive as well as increases predictive ability in a number of settings for measuring different behaviors.

Attitudes and Microfinance Participation

The literature on attitudes towards microfinance participation is somewhat limited and what is there is confusing. Hence, there are a number of difficulties that limit the

ability to study attitude formation towards microfinance scheme. Most remarkable is the fact that the literature is characterized by inconsistent definitions of the variables by numerous disparities in items used to measure attitudes towards microfinance as well as in the labels used to identify them. Each researcher tends to use customized attitudinal measures (Strauss and Gargano, 1987; Ashraf, 2015). Besides, theoretical frameworks supporting the selection of variables that relate to attitudes generally are not used and consequently model building has been fragmented (Kuruvilla and Sverke, 1993). Therefore, conceptual and empirically clear constructs are necessary if research on members' attitudes toward microfinance is to advance. The TBRPB offers an opportunity to remedy the issue of fragmentation by incorporating appropriate variables into the model.

Several attempts have been made to arrive at general measures of attitudes towards microfinance (Evans et al., 1999), but the results have been complex to compare owing to numerous inconsistencies found in the different measures. Jansen and Pippard (1998) studied the Grameen Bank (GB) in Bangladesh as a model of microenterprise development in focusing women's attitudes towards economic and social development needs and performance of the bank. The study uses content analysis based on secondary information in describing gender inequities in women's participation as a background for understanding the importance of GB for poor women in the rural Bangladesh.

McShane (1986) completed a construct validation of general attitudes. Deshpande and Fiorito (1989) drew a distinction between general and specific attitudes, noting that the former term refers to beliefs about the effects of all workplaces while the later refers to beliefs about effects at the respondents at the workplaces. Specific attitude provides a better prediction of relevant criteria than to general attitudes (Deshpande and Fiorito, 1989; Barling et al., 1992). This observation is consistent with the more general finding that attitudes towards specific behaviors offer stronger predictions than do more diffused attitudes (Ajzen and Fishbin, 1980). However, such specific studies have not been conducted in microfinance participation opting instead for general measures.

SNs and Microfinance Participation

According to Fishbein and Ajzen (1980), the balance between SNs and rationality varies from situation to situation and from person to person. Behavior is an activity of low involvement that low normative pressure is likely to occur. An activity may require more normative pressure, particularly when there are significant consequences for performing the activity and for people who may depend on him or her (Rutter and Bunce, 1989). Therefore, because many of the participation activities are considered to be high involvement, SNs may influence the rationality to participate.

Recent findings indicate that a significant relationship also exists between SNs and finite rationality. Since most information that shapes individual's decisions is

obtained from their peers, family, coworkers and their own experiences, such a relationship appears to be reasonable. How much the individual may be influenced by the opinion of referent others depends on how much they value the advice given (Chang, 1998; Clark, 2000). Therefore, if the information secured from referent others is used to form an individual's decision, then it makes sense that there would be a direct relationship between SNs and finite subjective rationality.

PBC and Microfinance Participation

PBC has both a direct effect on behavior and an indirect effect on behavior through bounded rationality. An indirect effect is based on the assumption that PBC has motivational implications for the behavioral rationality of participation. When people believe they have little control over performing the behavior because of a lack of required resources, then their rationality to perform the behavior may be low even if they have a favorable attitude or SNs concerning the behavior (Ashraf, 2017). For instance, a female person may like the microfinance entrepreneurial activities and others in her locality may want her to be active in the MFIs, because she is viewed as someone who would be helpful for other participants. She may see the value of helping others and want to participate, but if she is faced with household duties, daycare and eldercare, she may feel in control of the situation and have no need of participating in microfinance activities (Ashraf, 2017).

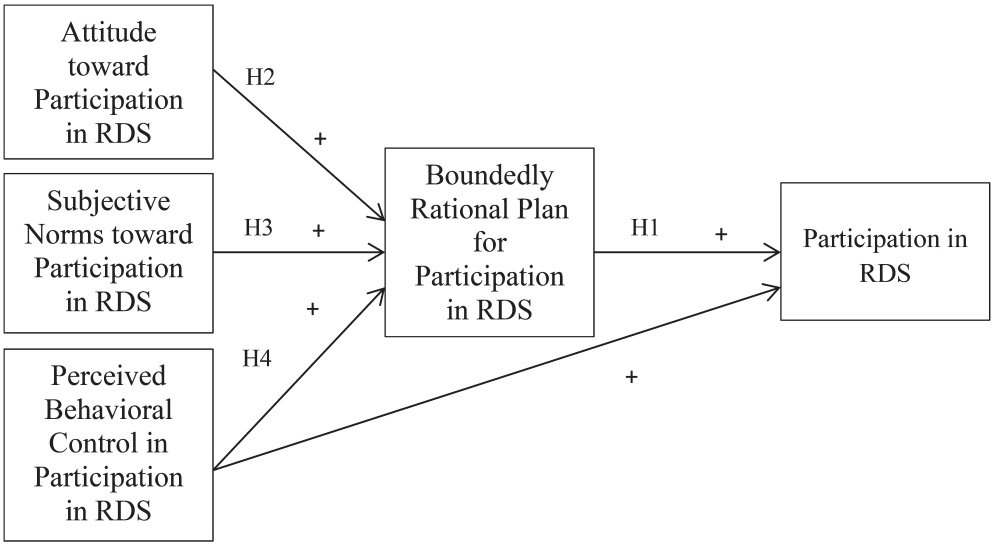
Consider the example above. Perhaps if the female had a very supportive spouse who helped out a great deal at home and other members in her immediate family who could help with eldercare, then her burden would be greatly reduced and she may be able to accomplish the microfinance activities. She still does not have volitional control, however, because she has total reliance on a family support system. However, at any given time, that support could be diminished and she would then again have to take on greater burden, perhaps impacting on her ability to participate in MFIs. Those who see themselves as having a relatively high degree of control over the behavior ought to be able overcome any obstacles to participate. Incorporating the PBC in a model of a particular activity is a way of considering the realistic constraints that may prevent rational choice from being translated into actual behavior (Ajzen and Madden, 1986; Ajzen, 1988, 1991).

Research Model and Hypotheses

The research model used in the study, shown in Figure 3, is based on TBRPB. The behavior in question is participation in IMFI. As mentioned earlier, the typical TPB model would include the generalized rational intention as a construct antecedent to

actual behavior. However, in the new model, we employed boundedly rational plan as a construct antecedent to participation behavior in an IMFI namely RDS.

Figure 3: Research Framework



Based on the research model provided in Figure 3 and the cases study of the participation in IMFI (i.e. in RDS), the present study formulates five hypotheses which are as follows:

- H1 Boundedly rational plan of the Islamic microfinance borrowers is positively related to choose participation in RDS;
- H2 Attitude of the borrowers of IMFI is positively related to subjective boundedly rational plan to choose participation in RDS;
- H3 Subjective norm of the borrowers of IMFI is positively related to subjective boundedly rational plan to participate in RDS;
- H4 PBC of the borrowers of IMFI is positively related to subjective finite rational plan to choose participation in RDS;
- H5 PBC of the borrowers of IMFI is directly and positively related to participation in RDS.

Methodology

Data collection took place in June-July 2017. A total of 190 borrowers from RDS were randomly selected from the northern districts of Bangladesh to complete a questionnaire that contained 7-point scale measures of the constructs of concern.

This seven-point scale was chosen, because Oaster (1989), Finn (1972), Nunnally (1978) and Ramsay (1973) reported that reliability is maximized with seven-point scales. As RDS is an Islamic MFI, the number of borrowers of it is not very large. There are about 325 borrowers in the study areas and thus, 190 as the sample size is adequate. The borrowers were interviewed face to face to fill in the questionnaire by some recruited interviewers. The questionnaire was pilot tested with a small number of RDS borrowers. Table 1 lists demographic statistics about the sample.

Table 1: Demographic Profile of the Respondents

	Frequency	**Valid Percent**
Gender		
Male	87	45.80
Female	103	54.20
Age		
18 – 20	9	4.70
21 – 35	90	47.40
36 – 50	77	40.50
Above 51	14	7.40
Marital Status		
Single	19	10.00
Married	164	86.30
Divorced	7	3.7
Education		
No education	113	59.50
Grade-5	40	21.00
Grade-10	26	13.70
Grade-12	5	2.60
Bachelor degree	6	3.20
Religion		
Islam	182	95.80
Hinduism	8	4.20

Source: Study Survey

The approach to testing the TBRPB model was based on that used by Ashraf (2016) to test a TPB model with decomposed belief structures. Measures of attitude (nine items), SNs (four), PBC (four) and normative structure (four) were all based on an instrument developed by Ashraf (2016). The referents used in the subjective norm questions were religious leaders, parents, spouse and friends. Measurers of boundedly rational plan (six items) were formulated based on the arguments of the Islamic tenets which can influence the way of their lives and behavioral activities. As multiple-scale items are preferred in most cases, unlike TPB, actual participation behavior of the

borrowers of RDS was measured by two items. There were also six demographic questions were included in the instrument (Table 1). All these items of different constructs are provided in the Appendix and descriptive statistics are included in Table 2.

The data were analyzed using structural equation modeling (SEM), using AMOS 20 version based on the procedure suggested by (Hair et al., 2010). First, the model in Figure 3 was run. Next, item loadings were checked in the exploratory factor analysis (EFA) to make sure they were all above 0.50 in the confirmatory factor analysis (CFA) and all were except one item in the construct of PBC. The coefficients of reliabilities (Cronbach alpha) were then computed for each construct and were presented in Table 3. The measurement model with the constructs' item loadings appears in Figure 4 for EFA and in Figure 5 for CFA. All constructs made up of at least two items and above. The Cronbach alpha values are above .70 except for the SNs construct which is above the acceptance level (Nunnally, 1978). All measures of average variance extracted (AVE) are above 0.50 which is higher than acceptable level of 0.40 (Fornell and larcker, 1981) and included in Table 3. The statistical significance of the paths in the model was tested using bootstrapping's jackknifing procedure, with a sample size of 1, for 190 samples. Using one- tailed tests, it was observed that two paths were statistically significant at $p<0.01$ level, two at $p<0.05$ and one at $p<0.10$ providing support for H1, H2, H3, H4 and H5. The evaluated model is shown in Figure 6, with path coefficients and standard weighted regression listed in Table 4.

Results and Discussion

Results of data analyses using correlations, ANOVA and SEM (by AMOS 20 version) are presented in this section of discussion. Based on the analyses, it was observed that the attitude of RDS borrowers had a strong significant influence on their boundedly rational plan at $p<0.01$ level supporting H2 and boundedly rational plan had, in turn, also strong significant influence on the participation of the borrowers of RDS at $p<0.01$ level supporting H1. Besides, subjective norms significantly influence boundedly rational plan at $p<0.05$ level and perceived behavioral control is also significantly associated with boundedly rational plan toward participation in RDS at the same $p<0.05$ level supporting H3 and H5. However, PBC was observed to influence boundedly rational plan of RDS borrowers significantly at $p<0.10$ level of significance. As would be expected from TBRPB, all of the associations between individual constructs are observed to be positive and finally supporting a strong validity of this new theory, TBRPB.

Table 2: Descriptive Statistics, Skewness and Kurtosis for Constructs

Constructs	*n*	Min.	Max.	Mean	SD	Skewness	Kurtosis
Participation	190	2.50	5.50	4.90	.60	-1.931	4.850
Boundedly Rational Plan	190	2.50	7.00	5.77	.88	-1.131	1.417
Attitude	190	2.33	6.56	5.32	.68	-1.300	3.044
SNs	190	2.00	6.75	5.10	.85	-.602	1.030
PBC	190	1.70	7.00	6.04	.82	-2.003	6.415

The descriptive statistics for the scales including skewness and kurtosis are included in the Table 2. The mean values of the constructs of the study indicate satisfactory outcomes. That means, all the constructs have more than 4 (neutral scale) as the study uses the seven-point Likert scale indicating the range from 1 for strongly disagree to 7 for strongly agree. Hence, it is found that rural poor borrowers used to have favorable experience in borrowing microfinance from RDS. The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George and Mallery, 2010). Hair et al. (2010) and Bryne (2010) argued that data are considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. Hence, it was suggested that the absolute value of Skewness and Kurtosis should not be greater than 3 and 7. Based on these recommendations the absolute values of the Skewness and Kurtosis of all the items in this study (see Table 2) are within the acceptable range of less than 3 and less than 7 respectively indicating the normality of the distribution of the collected data in the sample. This means that the data which were used in the analysis of the study is amply a representative sample of the population.

Table 3: Reliability, Correlations and Average Variance Extracted (on diagonal in italic)

Constructs	C.R	1	2	3	4	5
Participation (1)	-	*.71*				
Boundedly Rational Plan (2)	.84	.70**	*.65*			
Attitude (3)	.78	.71**	.80**	*.56*		
SNs (4)	.62	.52**	.60**	.69**	*.58*	
PBC (5)	.70	.54**	.57**	.58**	.40**	*.59*

The correlation analysis presented in Table 3 indicates that all the coefficients are highly statistically positively significant. It means that all the constructs have high correlations which indicate a strong coherence among the constructs of the model of the theory of bounded rational behavior (TBRPB). Particularly, the correlation coefficients between rationality and participation (.69), attitude and rationality (.80), attitude and SNs (.69) and attitude and participation (.70) indicate a high correlation

of the respective constructs in the model. The test of reliability analysis also appears considerably to be robust results. According to Likert (1938), the minimum acceptable level of the alpha value of the reliability coefficient is 0.60. The results are presented in Table 3, only the reliability coefficient of subjective norm is less than .70 but above .60. However, all other reliability indices are above 0.70 which indicates robust internal consistency of the inherent constructs of the model.

The values of R^2 and adjusted R^2 are observed to .55 and .54 respectively which indicate robust indication of high goodness of fit of the model. The underlying ANOVA test also provides a good fit yielding the outcome as $F(4, 190) = 60.33$, $p < 0.00$. All these tests suggest that the model's goodness of fit is highly statistically significant and the model's logical validity is restored well.

Figure 4: Measurement Model with Item Loadings: EFA

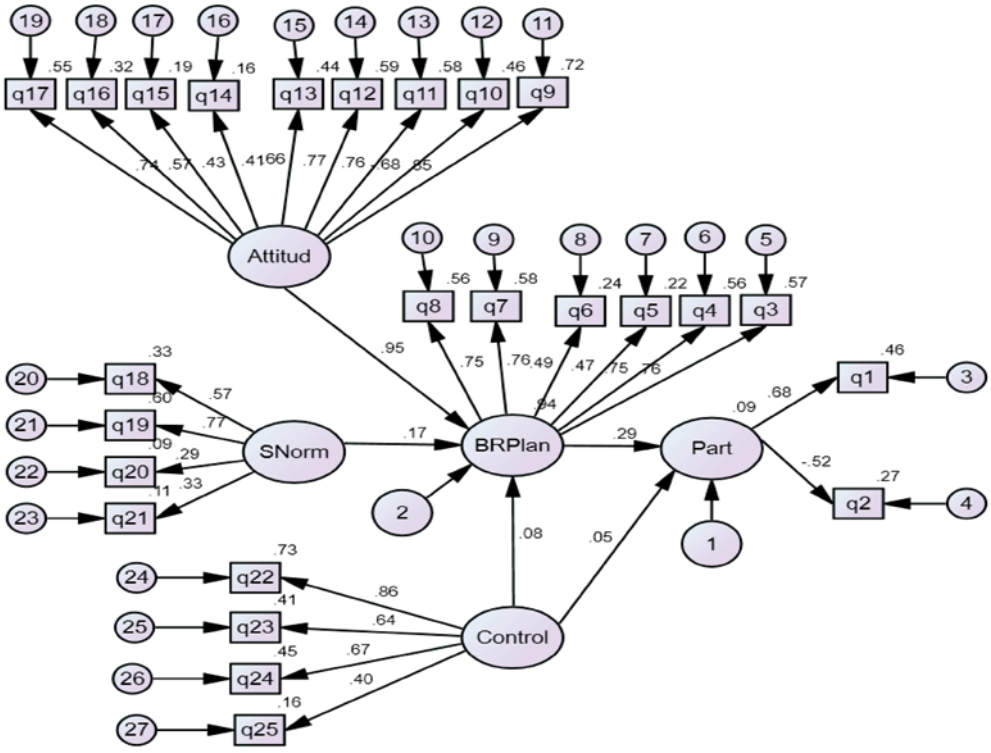


Figure 5: Measurement Model with Path Loadings: CFA

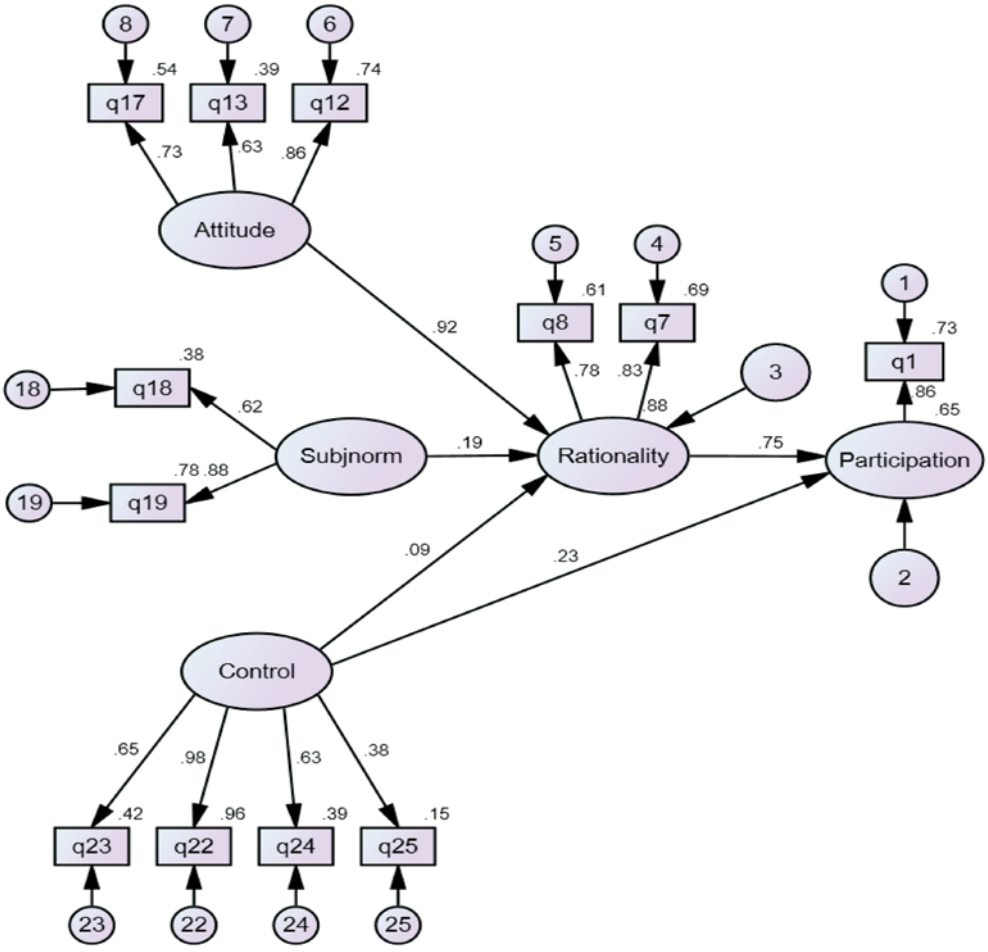


Figure 6: Evaluated Model

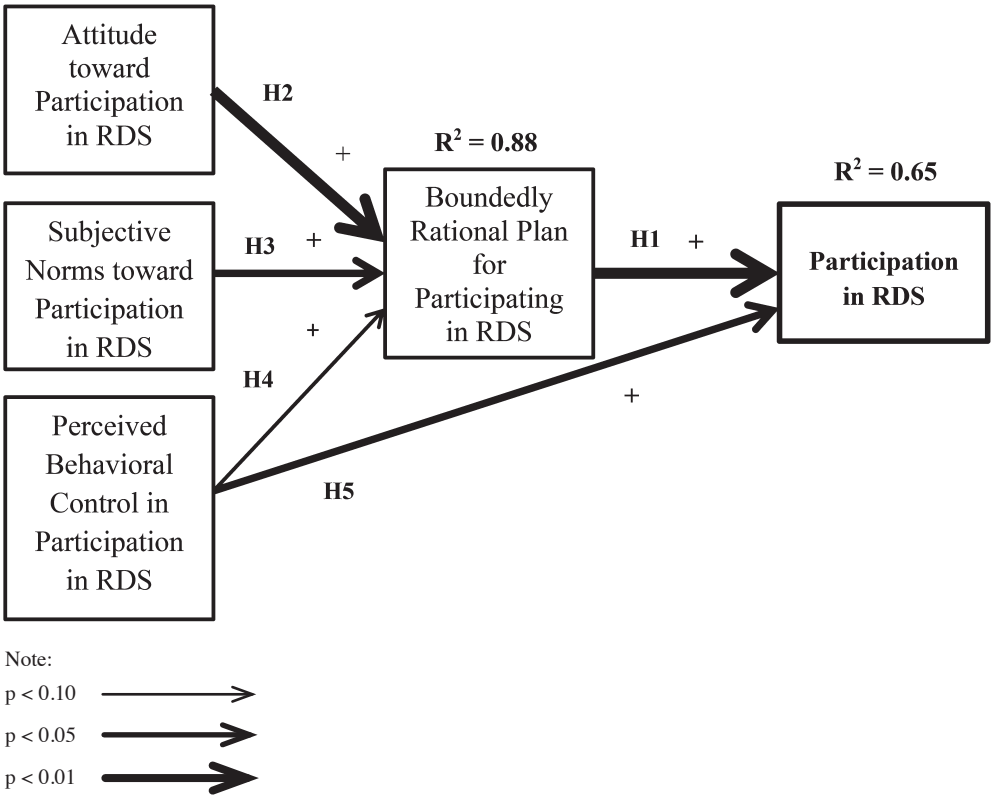


Table 4: Results Based on Standardized Regression of the Model Fit

Hypothesis	Variables			Std. Estimate	S.E.	C.R.	P
	Endogenous		Exogenous				
H1	Participation in RDS	←	Boundedly Rational Plan	0.75	0.150	9.849	***
H2	Boundedly Rational Plan	←	Attitude	0.92	0.081	10.689	***
H3	Boundedly Rational Plan	←	SNs	0.19	0.167	1.923	**
H4	Boundedly Rational Plan	←	PBC	0.09	0.175	1.791	*
H5	Participation in RDS	←	PBC	0.23	0.146	1.980	**

Note: *** Sig. at p < 0.01 level, ** Sig. at p < 0.05 level, Sig. at p < 0.10 level

Table 5: Model Fit Indices

Name of Category	Name of Index	Level of Acceptance	Values Extracted from Fit Model,
1. Absolute fit	Chisq.	P > 0.05	P = 0.655
	RMSEA	RMSEA < 0.08	RMSEA = 0.072
	GFI	GFI > 0.90	GFI = 0.912
2. Incremental fit	CFI	CFI > 0.90	CFI = 0.910
	TLI	TLI > 0.90	TLI = 0.913
3. Parsimonious fit	Chisq/Df = Ratio	Ratio < 5.0	Ratio = 0.957

Source: Zainudin, A. (2012)

Figure 4 demonstrates the factor loadings resulted from exploratory factor analysis (EFA). Figure 5 demonstrates the results of the fit model of the confirmatory factor analysis (CFA) in which the factor loadings of latent to observed variable should be 0.60 or higher for already established scales to ensure uni-dimensionality (Zainudin, 2012). According to the suggestion of Zainudin (2012), items with factor loading less than 0.60 were deleted in order to achieve uni-dimensionality and the remaining numbers of items for each construct are presented in the fit model. However, one of the factor loadings belonged to PBC construct in the CFA is observed to be closed to 0.40 which is a poor observation but acceptable according to Tabachnick and Fidell (2007) and Comrey and Lee (1992) who suggest using more stringent cut-offs going from 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good) or 0.71 (excellent).

The overall results of the SEM analysis presented in Figure 4 for EFA and Figure 5 for CFA indicate that all the hypotheses are fully supported by the data collected by the survey. The path value between the boundedly rational plan and the behavior of participation in RDS is observed in the measurement of fit model (Figure 5) to be 0.75 with R^2 of 0.65. In the model, the path value between attitude and boundedly rational plan is considerably high 0.92 with R^2 of 0.88. The path values between SNs and boundedly rational plan, and PBC and boundedly rational plan is observed to be 0.19 and 0.09 respectively. The path value between PBC and actual participation in RDS is found to be 0.23. However, all those path values are statistically and positively significant indicating supports for all of the hypotheses postulated in the model for predicting participation in RDS.

Table 5 represents the information of the fitness indices, their acceptance level, and actual values obtained by the fit model. Hair et al. (2010) and Zainudin (2012) recommend the use of at least three fit indexes by including at least one index from each category of model fit. The three fitness categories are absolute fit, incremental fit, and parsimonious fit. The researchers could choose at least one fitness index from each category to report depending on the literature referred earlier. In this study, at least one index is found in acceptable range from three categories of fitness. Therefore, goodness of fit is achieved in this study (see Table 5).

As all the measures of the study came from the same questionnaire, the study has examined common method bias (CMB) tests following Herman's single factor variance using SPSS and common latent factors bias tests using AMOS 20. Herman's single factor variance score has been observed to be 27 percent which is much less than 50 percent. The common latent factor score is found to be 7 percent which is also in an acceptable level that there has been no measurement errors involved in the study (Podsakoff et al, 2012).

Comparison of Predictability between TPB and TBRPB

We present a modified version of the Theory of Planned Behavior (TPB) by replacing the behavioral intention component with another component, namely the bounded rationality component which is basically the plan of an individual formulated based on circumstantial rationality to be involved in actual behavior of concern. The items that we use to measure this component in TBRPB are provided in the Appendix. We then show that all correlations between your measures are in the predicted direction. However, in order to show that your modification was necessary and/or allows for progress, we would have to compare the predictive power of the new model with the predictive power of the "classical" TPB. Only if the modified TBRPB model can predict participants' behavior better than the original TPB can, then this would be an argument in favor of our theoretical modification. We present such evidence by which it would be clear whether any progress can be made by following our theory.

Table 6: Comparison between TPB and TBRPB Statistics

		Correlations			**Regression Coefficients**			
Study	**Intention**	**AT**	**SN**	**PBC**	**AT**	**SN**	**PBC**	**RA**
TPB								
Van Ryn Vinokur (1990)	Job Search	.63	.55	.20	.48	.35	.07	.71
Walter (1989)	Election Vote	.33	.70	.80	.41	.15	.36	.72
Ajzen Madden (1986)	Attend Class	.51	.35	.37	.43	.22	.26	.63
Guddin et al. (1990)	Exercise	.42	.13	.50	.76	.01	.39	.55
TBRPB	Boundedly Rational Plan							
Present Study	Participation in Islamic Microfinance	.80	.60	.57	.92	.19	.23	.75

The results of the empirical examination of the present study indicate strong correlations between the different constructs of the model. Particularly, the correlations between the constructs of bounded rationality and actual behavior, attitude and rationality, SN and rationality, and PBC and rationality appear to be high. Hence, it demonstrates the ability of prediction about the future as well as explanation of the phenomena which are considered to be the criteria of a theory to be a scientific

(Friedman, 1953). In this respect, it is confirmed that at least for the present data about the participation in an IMFI employed in this study the model of the theory of boundedly rational planned behavior has worked very well. Though it is not sufficient yet to confirm the robustness of a theory to work well, the theory needs to be tested in other varieties of data set taken from different fields of activities. Hence, it needs further investigations for examining whether the theory works well to predict about the behavior.

It is then the task of other researchers to take this new model under their investigations to test its validity as a theory which can be used to scrutinize the actual behavior based on individual rationality of an individual human being. Once it can be done, the general assumption that every human being is generally rational will be disproved and the efficacy of the neoclassical economics has come into the question whether it is true for everybody else. If it can be tested that rationality of every individual human being is different rather than universal, this theory will be advanced one more test to be a valid theory combining economics and psychology which may be called as a theory of behavioral economics.

Implications for Research and Practice

From a research perspective, the study results demonstrate once again the robustness of the TBRPB for helping to explain participation in Islamic microfinance institute of Rural Development Scheme (RDS). As TBRPB is a new theory, there has not yet been other study which has successfully used the TBRPB as a theoretical framework from which to explain participation toward Islamic microfinance or other such activity. In addition to the importance of attitudes toward participation in RDS, this study has found SNs to be important, while it has also found that PBC to be important as well. At least, this case of RDS demonstrates the increased power of the TBRPB. As more and more studies of participation behavior and its antecedents are done within the TBRPB framework, we will more be able to discover and confirm which antecedents are most important, helping us build a robust theory of bounded rational behavior, TBRPB.

From a practical perspective, as a cumulative body of work on this topic emerges, we will be better able to advise academicians and practitioners on the elements they need to address in order to apply this model to similar activities. In this study, the one area of findings that may help the authority of microfinance the most concerns boundedly rational plan to participate in MFIs. We found that positive attitudes about the participation in IMFIs were associated with bounded individual rational plan and this boundedly rational plan was in turn associated with actual participating behavior in IMFIs. Similar arguments can be advanced in the cases of SNs and PBC which are positively associated with the limited rationality of individual participants in IMFI of RDS.

Directions for Future Research

This study considered no antecedents to attitudes, SNs and PBC toward rationality to participation in Islamic microfinance institute. There may well be factors that should be considered in future research to check whether the theory works properly to predict the actual behavior of particular interest. Valid and reliable scales for these constructs need to be developed, however, in order to include them in future studies.

Limitations

As with any study, there are limitations to the study described here. One possible drawback is the use only of the rural poor as respondents, because microfinance activities are only concentrated in the rural areas of Bangladesh in order to alleviate rural poverty. In order to check with the case for urban-based people, it could have been include urban people involved in some other activities. Nevertheless, the usual cautions about over-generalizing findings from this sample, to populations for which it is not strictly representative, apply. The sample was not randomly drawn to represent a population to which findings could be generalized. Instead, it was a convenience sample, and as such, the ability to generalize the findings very far beyond the sample is limited.

Declarations

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Conflicts of interest/Competing interests

There is no conflict of interest/Competing interests

Availability of data and material

Data will be available upon request.

Code Availability

The computer program results are shared through the tables in the manuscript.

Authors' Contributions

Not applicable.

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Appendix

Questionnaire on Participation in RDS

1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neutral, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree

Items	Opinion						
Participation							
Q1. I am now participating in RDS.	1	2	3	4	5	6	7
Q2. I am not participating in RDS.	1	2	3	4	5	6	7
Boundedly Rational Plan							
Q3. I plan to participate in RDS.	1	2	3	4	5	6	7
Q4. I will definitely participate in RDS in near future.	1	2	3	4	5	6	7
Q5. Since RDS is based on Islamic laws, I should participate in it.	1	2	3	4	5	6	7
Q6. I plan to participate, because I believe that RDS is based on Islamic ethics properly.	1	2	3	4	5	6	7
Q7. I plan to participate, because I feel that RDS will provide me mental satisfaction.	1	2	3	4	5	6	7
Q8. I plan to participate, because I consider that RDS would be more profitable.	1	2	3	4	5	6	7
Attitude							
Q9. I believe that participation in RDS is a good idea.	1	2	3	4	5	6	7
Q10. I believe that participation in RDS is bad idea.	1	2	3	4	5	6	7
Q11. I feel that I should participate in RDS.	1	2	3	4	5	6	7
Q12 I consider that RDS is good to increase income.	1	2	3	4	5	6	7
Q13. I feel that RDS is fully complying Islamic principles	1	2	3	4	5	6	7
Q14. I believe that RDS is completely permissible in Islamic principles.	1	2	3	4	5	6	7
Q15. I believe that RDS would be free from fraudulent activities.	1	2	3	4	5	6	7
Q16. I feel that I would be financially gainer participating in RDS.	1	2	3	4	5	6	7
Q17. I feel that RDS is fully complying Islamic principles	1	2	3	4	5	6	7
Subjective Norms							
Q18. My religious leaders inspire me to participate in RDS.	1	2	3	4	5	6	7
Q19. My spouse encourages me to participate in RDS.	1	2	3	4	5	6	7
Q20. My friends suggest me to participate in RDS.	1	2	3	4	5	6	7
Q21. My parents advise me to participate in RDS.	1	2	3	4	5	6	7
Perceived Behavioral Control							
Q22. I am capable of participating in RDS.	1	2	3	4	5	6	7
Q23. Participation in RDS is entirely within my control.	1	2	3	4	5	6	7
Q24. I have the resources and the knowledge and the ability to participate in RDS.	1	2	3	4	5	6	7
Q25. I feel comfortable participating in RDS.	1	2	3	4	5	6	7

Demographic Information:
(26) Age: .....
(27) Gender: M / F
(28) Education: ……..
(29) Monthly Income: **……**
(30) Religion: (a) Islam (b) Hinduism (c) Christianity
(31) Marital Status: (a) Single (b) Married (c) Divorced