A Rasch analysis of the community's preference for different attributes of Islamic banks in Indonesia

Budi Setiawan and Morita Panduwangi

Department of Management, STIE Kesatuan, Bogor, Indonesia, and

Bambang Sumintono

Institute of Educational Leadership,
Universiti Malaya, Kuala Lumpur, Malaysia

Abstract

Purpose – The purpose of this paper is to investigate the degree to which the different attributes of Islamic banks in Indonesia are preferred by the community.

Design/methodology/approach – This paper uses a quantitative approach by applying Rasch analysis to measure the relative importance of 18 attributes of Islamic banks to the community. The data were collected by questionnaires, which were distributed online and completed by 345 respondents. In addition to the Rasch model, the preference of attributes was measured by a statistical inference test, using "SPSS" software, which employs binary logic regression related to the agreement between the performance of attributes and expectations.

Findings – The instrument used in this study showed good reliability, and its validity fits the expected model. The results show that the assurance of financial security, friendliness and the application of Islamic principles in their operations are the most important attributes to be considered when people choose an Islamic bank. The degree of importance placed by the community on the various attributes of Islamic banks will have an effect upon the actual and perceived quality of those attributes. An increase in the community's preference for a particular attribute will eventually be followed by an increased agreement between the actual performance of that attribute and the community's expectation.

Research limitations/implications – The varied profiles of individual respondents were not explored fully: this research relies solely on quantitative analysis. So, there is no empirical information to inform the Islamic banks as to which segments of the community should be the focus of their promotional activities.

Originality/value – The use of Rasch analysis to measure the community's preference for various attributes of Islamic banks has not been done previously.

Keywords Rasch model, Islamic banking, Product attributes, Consumer's preference, Consumer's behaviour

**Paper type** Research paper

Introduction

The first Islamic bank in Indonesia was established in 1991 and, since then, the growth of Islamic banks has faced many challenges. For example, the Financial Services Authority of the Republic of Indonesia (OJK) (2015a) reported that both the national and Islamic financial sectors had not expanded as much as expected and faced decelerating growth. Table I shows how the Islamic banking sector has grown in Indonesia over the last decade (Financial Services Authority of the Republic of Indonesia (OJK), 2015b). It can be seen that the number of offices of the national Islamic banks and the number of offices of Islamic business units has declined from peak values in 2014 and 2013, respectively. Figure 1 depicts the joint net income of Islamic banks and Islamic business units: despite an increase in 2016, joint net income has still not recovered from its decline in 2014. Thus, the trend of a

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Islamic commercial bank										
Number of banks	3	5	6	11	11	11	11	12	12	13
Number of offices	401	581	711	1,215	1,401	1,745	1,998	2,163	1,990	1,854
Islamic business unit										
Number of conventional banks that have Islamic business unit	26	27	25	23	24	24	23	22	22	21
Number of offices	196	241	287	262	336	517	590	320	311	322
Islamic rural bank										
Number of banks	114	131	138	150	155	158	163	163	163	164
Number of offices	185	202	225	286	364	401	402	439	446	453

Table I.
The development of
Islamic banking
2007–2016
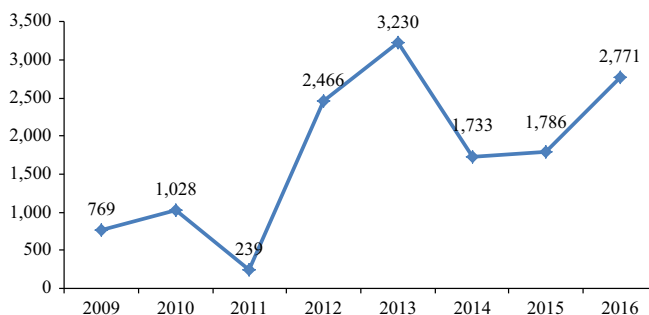
Figure 1.
Joint net income
(billion IDR) of Islamic
commercial banks and
business units

decreasing number of offices of Islamic banks and their business units is matched by a decrease in their composite net income.

OJK identified that, up to 2015, there had been various internal strategic factors which had affected the development of Islamic banking in Indonesia. The main factors were the high cost of funds resulting in a limited segment of financing; unvaried products; unexpected services; inappropriate quality and quantity of human resources; and the low comprehension and awareness of Islamic bank by the community. Also, Islamic banks had to face the challenges of the global economy (which had not shown any significant recovery) and the fluctuation of oil prices. These global challenges were highlighted in the report of EY (member firms of Ernst & Young Global Ltd). This report stated that the market share of Islamic banking in Indonesia is still expected to be below 10 percent in 2020 (EY, 2016).

Appropriate solutions should be sought with which to counteract the various strategic issues that are restricting the development of Islamic banking. The development of Islamic banking ought to consider all three stages of a consumer's behavior (pre-consumption, consumption and post-consumption). This means recognizing the consumer's requirements in each stage, because the level of value created at any of these stages influences the consumer's opinions, feelings and actions toward the brand or product (Solomon *et al.*, 2012). Hence, the Islamic banking industry will grow and eventually may result in the successful internationalization of Islamic banking (Khan *et al.*, 2011; Amin *et al.*, 2013).

The perspective of a consumer's behavior toward the attributes of Islamic banks has a close affinity with the banks' efforts to raise strategically their competitiveness, by focusing on their customers' satisfaction and loyalty. Therefore, it is very important for Islamic banks to identify their customers well, namely their needs and their lifestyle (Khan, 2010; Moon *et al.*, 2011). Any efforts to recognize the customers' preferred attributes of a bank will

influence their decision in choosing their bank (Wulandari and Subagio, 2015). Islamic banks need to know which attributes their existing and prospective customers consider when selecting a bank. This knowledge will enable appropriate strategies to be established to create customer satisfaction and loyalty (Echchabi and Nafiu Olaniyi, 2012). The appropriate attributes of banking products will be powerful tools in evaluating the brand positioning (Gwin and Gwin, 2003).

Studies of customers' preferences when selecting Islamic banks have been carried out by several researchers, particularly those from Islamic majority countries such as: Malaysia (Echchabi and Nafiu Olaniyi, 2012), Pakistan (Ahmad *et al.*, 2010); Bangladesh (Khan *et al.*, 2008), Bahrain (Al-Ajmi *et al.*, 2009), Turkey (Okumus and Genc, 2013) and Indonesia (Setiawan *et al.*, 2015). Earlier studies have not used the Rasch model. The models and research instrument tests used in those studies were limited to classical measurement theories. This is the research gap addressed by this paper. Specifically, the objective of this research is to measure the community's preference in relation to the primary attributes of Islamic banking in Indonesia and its influence on the overall perception of the performance of Islamic banks. This follows a review of the relevant literature. The Methodology section (which contains data collection and the Rasch measurement model) is discussed subsequently, followed by the findings, discussion and conclusion.

Literature review
An overview of the basis of customer preferences in Islamic banking
The decision of customers to use Islamic banks is determined by the various attributes attached to the products and services of the banks (Khan *et al.*, 2008; Khattak and Rehman, 2010; Setiawan *et al.*, 2015). A range of attributes will form the empirical basis of any research carried out to measure the satisfaction of customers with their chosen bank (Estiri *et al.*, 2011).

The research of Amin *et al.* (2013) identified the attributes of Islamic banks that influence the choices made by existing and prospective customers. These are: the religious motive (Islamic principles of profit and loss sharing) and the assurance of safety for customers during their banking transactions. The results of Echchabi and Nafiu Olaniyi (2012) revealed that the preferred attributes of customers consist of: network, systematization and communication (information technology (IT) factors); environment, convenience, cleanliness and location (physical evidence factors); flexibility, competence, friendliness and efficiency (service factors); variety and transaction fees (product factors); and image and social responsibility (Islamic reputation factors). These results are compatible with the work of Sangeetha and Mahalingam (2011) and Estiri *et al.* (2011).

The fundamental differences between Islamic and conventional banks are that the former do not pay interest and will only invest in businesses considered rightful (*halal*) in Islam. The profit sharing system, which is the fundamental principle of Islamic banking, is not found in the conventional banking system, which instead retains profit and pays interest. Consequently, the religious motive of Islamic principles and the profit and loss sharing system can be considered as the dominant factor considered by Muslim customers when selecting an Islamic bank (Amin *et al.*, 2013).

Another important factor is image, because this is one of the components of service quality that is essential for service businesses. Therefore, a good image of Islamic banking in a customer's mind will be a key means by which to differentiate Islamic banking and to create competitive advantage (Sangeetha and Mahalingam, 2011; Osman *et al.*, 2015). From a company's point of view, this image is an association that resides deeply in the minds of customers when they hear or see the company's brand name. This becomes a reflection of the combination of the product's characteristics in customers' minds (Nguyen and Leclerc, 2011; Amin *et al.*, 2013). In conclusion, image is a fundamental attribute considered by customers when selecting an Islamic bank (Osman *et al.*, 2015).

OJK (2015a, b) stated that IT is one of the major factors which contributes to the success of product and service development by banks, including overall banking operations. IT as a business driver brings benefits for customers by increasing the convenience of banking operations. For the bank, IT enables customers to be acquired, increases the efficiency of operations and catalyzes the growth of fee-based income. Therefore, Islamic banks will need the latest and most representative IT to help their automatic operations run smoothly, especially in the current era of globalization, which requires financial transactions to be done anywhere and anytime. The systematization of Islamic banking services based on IT can be seen in the availability of cash machines, internet banking, mobile banking and SMS banking supported by an integrated banking network. Consequently, systematization and banking networks are attributes considered by customers in selecting an Islamic bank (Echchabi and Nafiu Olaniyi, 2012).

The quality of Islamic banking services
Islamic banks can increase the satisfaction and loyalty of their customers by addressing the aspect of tangibility, i.e. the availability of service points. The measurable attributes related to the tangibility aspect of Islamic banks are: the location and ease of access of service points; and the cleanliness, comfort and esthetic qualities of the banks' offices (Echchabi and Nafiu Olaniyi, 2012). Because of the desire of customers for tangibility, Islamic banks that provide it will be perceived by their customers as delivering service of a high quality, and so will increase the satisfaction of their customers (Setiawan *et al.*, 2015).

In addition to the religious motive, the image of the Islamic banks in their customers' minds, systematization and the tangibility and esthetic atmosphere of the service points, there is another attribute which has an influence on the decision by customers to choose Islamic banking. That attribute is excellent communication between bank service officers and customers, both face-to face in the bank service room and through call center communication (which can be accessed at any time by systematization) (Echchabi and Nafiu Olaniyi, 2012). The quality of the interactive communication between a bank and its customers is an attribute that can be utilized in measuring the construct of value proposition, and it has a major influence on the satisfaction of customers with Islamic banks (Estiri *et al.*, 2011). The attribute of communication was also used in a model as an indicator of the quality of banking service by Sangeetha and Mahalingam (2011). This model was adapted from the customer service quality scale developed by Kemal Avkiran (1994) and service quality factors based on satisfaction by Johnston (1997). The service officers of a bank must be competent and flexible when delivering services to customers, so as to deliver fast services without any mistakes whilst at the same time maintaining their hospitality. Therefore, the attributes of the friendliness, flexibility and competence of service officers, together with the speed of delivery of services, can be used to measure the preference of customers in selecting Islamic banks (Echchabi and Nafiu Olaniyi, 2012).

One of the determinants of successful marketing by Islamic banks of their products is the degree to which transaction fees are both competitive and in accordance with Islamic principles (Kamarulzaman and Madun, 2013; Khan *et al.*, 2008; Khattak and Rehman 2010). Estiri *et al.* (2011) and Echchabi and Nafiu Olaniyi (2012) also stated that the nature of the transaction fees offered by Islamic banks will have a big influence upon a customer's choice of bank. The transaction fees of Islamic banks are also related to the types and variety of products offered, which fall mainly into three categories, namely funds distribution products, funds collection products and service products, offered by the banks to their customers. Accordingly, the range of products offered is an important attribute that influences the selection of Islamic banks by customers (Echchabi and Nafiu Olaniyi, 2012). The variety of products offered can be increased by the differentiation of existing products.

This can be done by quality (from the highest or the lowest), additional features and other innovations (Gwin and Gwin, 2003).

When doing financial transactions with an Islamic bank, customers expect an assurance of safety from the bank (Amin *et al.*, 2013) as part of a good quality service (Estiri *et al.*, 2011). This assurance of safety means that the bank guarantees: the money deposited; the legality of the bank; and the existence of a reliable security system to protect customers when they have transactions either in the bank itself or via cash machines, telephone or the internet. In many regions of the Republic of Indonesia, every bank (Islamic or conventional) is required to be a member of the Indonesian Deposit Guarantor Institution (2010) (LPS), based on the Decree of the Indonesian Deposit Guarantor Institution No. 2/PLPS/2010. Hence, the assurance of security is an attribute considered by customers when selecting a bank.

In their operations, Islamic banks demonstrate their responsibility to the communities in which they operate through a program called corporate social responsibility (CSR). This aspect of public relations forms a part of the marketing mix. The reputation of Islamic banks is enhanced by their commitment, which is not only oriented to the accomplishment of financial profit, but also to social empowerment. CSR will improve the image of a bank, and consequently the adoption of CSR by Islamic banks is an attribute that will make them more likely to be chosen by customers (Echchabi and Nafiu Olaniyi, 2012).

Previous studies
There are previous studies which measured specifically the attitudes of customers toward the attributes of the Islamic banks. The study conducted by Ahmad *et al.* (2010) revealed that the customers of Islamic banks have an enhanced perception of the quality of service offered compared to the customers of conventional banks. The attributes used to measure the dimension of service quality were tangibility, reliability, responsiveness, assurance and empathy. These dimensions have a high level of reliability when used to measure customers' preferences. Estiri *et al.* (2011) showed that the quality of service delivery arising from the attributes of empathy, assurance, tangibility, responsiveness and reliability, together with the value proposition formed from the attributes of cost of service delivered, product portfolio, convenience, communication and reputation, will influence the satisfaction of customers, even though there is no guarantee of their loyalty. The research of Echchabi and Nafiu Olaniyi (2012) revealed that the preference of Malaysian customers toward the attributes of the Islamic banking is influenced by a combination of the quality of service offered, convenience, hospitality, the reliability of service officers and the location of branches. It was shown by Amin *et al.* (2013) that the satisfaction of customers is influenced by the image of a bank, and that the image is related to trust, which will then be followed by the customers' loyalty.

Methodology
This study investigates the degree to which the different attributes of Islamic banks in Indonesia are preferred by the community. This topic was chosen because, according to the OJK, Islamic banks have not reached their expected share of the national market and because of the significant strategic issues faced by the banks which are having an impact on their development.

The paradigm of this research is a quantitative approach, in which non-experimental design is applied to the research phenomena. The data gathered by measurement are of paramount importance, because they enable the links to be identified between empirical observations and quantitative mathematical expressions. Primary data were collected via questionnaires which were designed and distributed online using the Google Form platform. The questionnaires used the Indonesian language (Bahasa Indonesia), because the respondents were Indonesian citizens, and were distributed through social

media channels in various communities which were considered to be of relevance and familiar with bank transactions.

The research sample consisted of 345 persons, all of whom were either current or lapsed customers of an Islamic bank. So, each of them had experience of doing business with an Islamic bank.

Table II shows the profile of the respondents according to their demographic profile: gender, age, domicile and religion. It also gives information on the amount of money deposited in a bank by each respondent (expressed as a percentage of monthly income). It can be seen that the sample consisted of similar numbers of males and females, and that the majority were between 20 and 29 years old, lived in a city, had Islam as their faith religion and invested between 5 and 10 percent of their monthly income at a bank.

Table III shows the attributes of Islamic banks that were used in the questionnaire. Respondents were asked to rate the importance of these attributes to them when selecting

Category	Details	Persons (n)	Proportion (%)
Gender	Male	176	51.01
	Female	169	48.99
Age (in years)	< 20	9	2.61
	20–29	169	48.99
	30–39	89	25.80
	40–50	78	22.61
Domicile	City	229	66.38
	Village	116	33.62
Religion	Muslim	303	87.83
	Others	42	12.17
Funds allocation (% of income)	< 5	104	30.14
	5–10	139	40.29
	10–20	71	20.58
	> 20	31	8.99

Table II.
The profile of research respondents

Construct	Items (code)
Religious and Islamic reputation	Islamic principle (A1)
	Profit and loss sharing (A2)
	Image (A3)
	Social responsibility (A4)
Information technology	Network (B1)
	Systematization (B2)
	Communication (B3)
Physical evidence	Environment (C1)
	Comfortable (C2)
	Cleanliness (C3)
	Location (C4)
Services	Flexibility (D1)
	Competence (D2)
	Friendliness (D3)
	Efficiency (D4)
	Assurance (D5)
Product	Variety (E1)
	Transaction fees (E2)

Table III.
The preferred attributes

an Islamic bank, using a Likert rating scale, namely score 1 = unconsidered, 2 = less considered, 3 = sufficiently considered, 4 = considered, 5 = strongly considered.

The data gathered by the questionnaire were evaluated by Rasch analysis, because that method of analysis enabled the ordinal data from the questionnaire to be transformed into interval data. Bond and Fox (2015) noted that the Rasch model is becoming the most appropriate method for basic analysis in the field of human sciences where an instrument (questionnaire) is used, and the measurement yields ordinal data. Fraser and Dorman (2011) stated that, because the Rasch model is based on probabilities, it allows the responses of persons to be predicted accurately on all items that fit the measurement model, using only a person parameter (as the person measure) and an item parameter on the same scale (as the difficulty measure). The Rasch model transforms the scores of items measured on a Likert rating scale (which is ordinal data), into an interval scale called "logarithm odds unit" (logit). Most logit values found in practice fall between −5.00 and 5.00 (Engelhard, 2013; Sumintono and Widhiarso, 2014, 2015). The item and person fit statistics indicate the extent to which the data obtained are suitable, reliable and in accordance with the basic measures, as well as giving information about the quality of the measurement.

According to Boone et al. (2014), there are several indications in the Rasch model which are very important both for the persons and the items. Some of them are psychometric properties, such as outfit mean square (MNSQ), outfit Z-standardized (ZSTD), and Point measure correlation (PT-Measure Corr.). The model evaluation begins by observing the value of outfit MNSQ, in which the value must be between the intervals of 0.5 and 1.5. This means that it is suitable for measurement. If the value of MNSQ does not lie in those intervals, it is necessary to study the obtained outfit ZSTD value, which is supposed to be between the interval of −1.9 and 1.9, indicating that the data have reasonable predictability. The consistency of internal reliability refers to the mean correlation among the items of the instrument. The Cronbach's α coefficient is used as the index of the consistency of internal reliability: if the value is close to 1 it indicates that the consistency of internal measurement is good.

The data were tabulated with Microsoft Excel software and were analyzed using Winstep version 3.73 software. The data which had an appropriate interval measurement and which also fulfilled all of the criteria of instrument validity and reliability in the Rasch model were then tested by binary logistic regression using SPSS software. This was because of the dichotomy of questions answered by the respondents.

Findings
Instrument reliability
The summary of instrument statistics, consisting of the person reliability and the item reliability, is presented in Table IV which shows that, by and large, the measurement gives good and reliable results. The result of the analysis contains two outputs, namely person-output and item-output. The person data in the table show whether or not the respondents are statistically fit, whilst the item table illustrates whether or not the items used in the instrument are fit. The mean of the person-output is 1.02 logit ($\mu > 0.00$), signifying that the respondents, in general, tend to agree on the relative importance of the different attributes of Islamic banks. Linacre (2012) stated that separation is the

	Mean	Separation	Reliability	Cronbach's α
Person	1.02	2.32	0.84	0.90
Item	0.00	6.02	0.97	

Table IV.
The summary of instrument statistics: reliability of person and item

signal-to-noise ratio in the data. Thus, it is known that the separation coefficient will give the square root value of the ratio between the true person variance and also the error variance in the data. Boone *et al.* (2014) stated that the indices of person-separation and item-separation are a very important addition to the evaluation of the function of a measurement instrument. The index of person-separation falls into three groups, namely do not consider, consider adequately and consider completely the various attributes of Islamic banks. It is concluded that the attributes used did assess correctly the preferences of the respondents when selecting an Islamic bank.

The Cronbach's α coefficient has a value of 0.90: this indicates that it has excellent reliability. In conclusion, the results show that there is a reliable interaction between the person and the attribute items. In other words, the results show conformity between the person and attribute items used. The item reliability score is 0.97, indicating that the item attributes used have excellent reliability. The 18 items that were measured yielded an item-separation score of 6.02 (rounded to 6), showing that there were six groups of the item, starting from the easiest ones to be considered to the most difficult ones.

Table V classifies the items according to their item logit score (which is shown in Figure 2). The classification of the items into six strata was done by dividing the distribution of the item logit score into six equal parts. Specifically, the stratification process used the percentile values of 16.67, 33.33, 50, 66.6, 7 and 83.33, respectively.
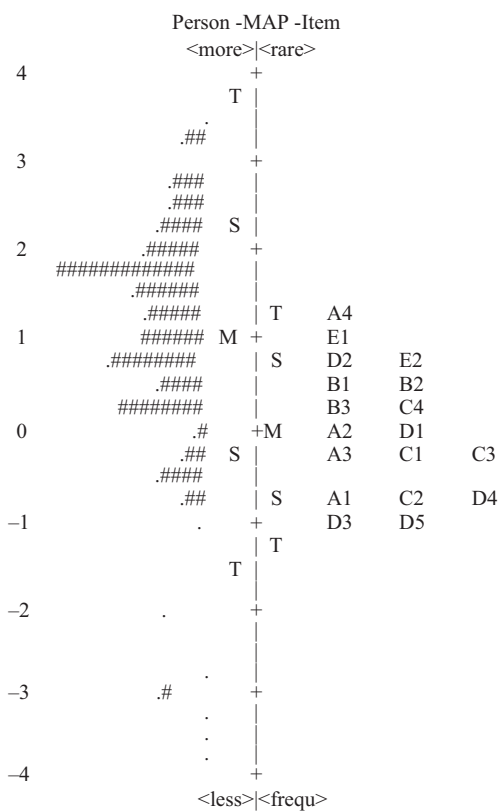
Figure 2 is an item–person map. On the left-hand side it shows the distribution of respondents according to their logit score, ranging from the least agreed person (logit score $= -3.63$) to the most agreed person (logit score $= +3.44$). On the right side of the map is shown each item's level of difficulty, ranging from the easiest one to be agreed upon (logit score $= -1.12$ of item D5) to the hardest one to be agreed upon (logit score $= +1.17$ of item A4). The items work well and are capable of separating individual respondents: that is to say they have good powers of discrimination.

The three groups of person-separation are as follows: there are 111 persons (32.17 percent) who do not consider (logit value < 0.680); 105 persons (30.43 percent) who consider sufficiently ($1.630 <$ logit value $\geqslant 0.680$); and 120 persons (37.39 percent) who consider strongly

Category	Criteria	Item/LVI
More difficult to be considered		
Difficulty Strata I	LVI $\geqslant 0.7249$	Social responsibility (LVI $= 1.17$)
		Variety (LVI $= 0.92$)
		Transaction fees (LVI $= 0.74$)
Difficulty Strata II	$0.7249 >$ LVI $\geqslant 0.4234$	Competence (LVI $= 0.65$)
		Systematization (LVI $= 0.49$)
		Network (LVI $= 0.46$)
Difficulty Strata III	$0.4234 >$ LVI $\geqslant 0.0100$	Location (LVI $= 0.35$)
		Communication (LVI $= 0.16$)
		Profit sharing (LVI $= 0.12$)
Easier to be agreed or considered		
Difficulty Strata IV	$0.0100 >$ LVI $\geqslant -0.2934$	Flexibility (LVI $= -0.1$)
		Environment (LVI $= -0.22$)
		Image (LVI $= -0.26$)
Difficulty Strata V	$-0.2934 >$ LVI $\geqslant -0.7966$	Cleanliness (LVI $= -0.31$)
		Comfortable (LVI $= -0.63$)
		Efficiency (LIV $= -0.73$)
Difficulty Strata VI	LVI < -0.7966	Islamic principle (LVI $= -0.81$)
		Friendliness (LVI $= -0.88$)
		Assurance (LVI $= -1.12$)

Table V.
The category of items based on their logit value (LVI)

```
                    Person -MAP -Item
                       <more>|<rare>
    4                        +
                           T |
                         .   |
                       .##    |
    3                        +
                      .###    |
                      .###    |
                     .####  S |
    2                .####    +
                ############# |
                 .######      |
                  .####      | T    A4
    1            ######  M  +       E1
             .########     | S    D2    E2
                 .####     |      B1    B2
              ########     |      B3    C4
    0              .#     +M     A2    D1
                  .##   S |      A3    C1    C3
                 .####     |
                  .##     | S    A1    C2    D4
   -1               .     +      D3    D5
                          | T
                       T  |
   -2              .      +
                          |
                          |
   -3             .#      +
                       .  |
                       .  |
                       .  |
   -4                     +
                     <less>|<frequ>
```

Notes: Each "#" is 4; each "." is 1–3

Figure 2.
Item–person map

(logit value ⩾1.630) the 18 attributes of Islamic banks. From the right-hand side of the item–person map, it can be seen that the attributes of assurance (logit value = −1.12), friendliness (logit value = −0.88) and Islamic principles (logit value = 0.81) are the ones considered the most by the respondents when selecting an Islamic bank. The attributes of social responsibility (logit value = 1.17), variety (logit value = 0.92) and transaction fees (logit value = 0.74) are the ones considered the least.

Person and item validity
A unidimensionality test of the instrument gives the empirical value of raw variance explained by the measures (41.2 percent). This is higher than the minimum value of 40 percent specified by Boone *et al.* (2014). As expected, the requirement of unidimensionality was reached and the level of item independency in the instrument falls into the category of "good."

Table VI summarizes the result of the person and item validity test by describing the values of MNSQ and PT-Measure Corr. All of the items have reached the critical values of MNSQ and PT-Measure Corr. According to Linacre (2012), the sensitivity of statistical output to outliers will make it easier to identify and correct any issues of fitness or appropriateness between the data and the model. It is seen that no item has a standard error measurement greater than 0.11, which means that all of the items were measured with a

Item	Outfit MNSQ	PT-Measure Corr.	Measure (logit)	SE measurement
Islamic principle (A1)	0.91	0.69	−0.81	0.11
Profit sharing (A2)	1.15	0.51	0.12	0.10
Image (A3)	1.34	0.55	−0.26	0.10
Social responsibility (A4)	1.15	0.44	1.17	0.09
Network (B1)	0.79	0.64	0.46	0.10
Systematization (B2)	0.86	0.64	0.49	0.10
Communication (B3)	1.08	0.62	0.16	0.10
Environment (C1)	1.99	0.40	−0.22	0.10
Convenience (C2)	0.72	0.75	−0.63	0.11
Cleanliness (C3)	0.69	0.72	−0.31	0.10
Location (C4)	1.00	0.63	0.35	0.10
Flexibility (D1)	0.71	0.66	−0.10	0.10
Competence (D2)	0.89	0.59	0.65	0.10
Friendliness (D3)	0.57	0.77	−0.88	0.11
Efficiency (D4)	0.80	0.74	−0.73	0.11
Assurance (D5)	0.82	0.69	−1.12	0.11
Variety (E1)	1.50	0.40	0.92	0.09
Transaction fees (E2)	1.18	0.57	0.74	0.10

Table VI.
Summary of item statistics

good degree of precision. Concerning the validity of persons, the standardized statistics test (ZSTD) is highly sensitive to the misfit when there are more than 300 observations. However, in this instance ZSTD can be ignored because the value of the mean square is acceptable. Only 26 respondents (7.53 percent) belonged to the misfit category: with such a small proportion of misfit respondents, it is concluded that there is no real interference or impact on the model when conducting statistics analysis.

Binary logistic regression test
The instrument used to measure the degree to which the different attributes of Islamic banks in Indonesia are preferred by the community has passed the reliability and validity tests based on Rasch analysis.

A Hosmer and Lemeshow test found the value of $\chi^2 = 13.207$, with degrees of freedom $= 8$ and the value of probability $= 0.105 > 0.05$. Therefore, the binary logistic regression model has fulfilled the assumption of goodness of fit. In all, 76.5 percent of the observed data can be predicted accurately by the model. Hence, the conclusion is that the model has estimated quite well. Table VII summarizes the results of the binary logistic regression test. It shows a larger value of the odds ratio amongst respondents who stated that the performance of the attributes agreed with their expectations. This value is 1.220 times bigger compared to the odds ratio of those who stated that the performance of the attributes did not agree with their expectations (for each unitary increase of the logit score of the preferred attributes). So, the degree to which the different attributes of Islamic banks are preferred by individuals in the community will influence their perception of the degree of conformity between the actual and expected quality of the attributes.

Variable(s)	B	SE	Wald	df	Sig.	Exp(B)
Constant	0.996	0.150	43.880	1	0.000	2.708
Preference	0.199	0.093	4.575	1	0.032	1.220

Table VII.
The results of the binary logistic regression test

Discussion
The attributes of friendliness and Islamic principles (item difficulty less than 0.00 logit) are two of the most important attributes considered by the respondents when selecting an Islamic bank. Also of significance is the attribute of financial security (item LVI = −1.12). This is in line with the research of Amin *et al.* (2013), who also found that the assurance of security was an important factor to be considered when selecting an Islamic bank. Another valued attribute is the friendliness of the officers of a bank when dealing with customers (item D3 with LVI = −0.88). For instance, officers should serve their customers cheerfully, give a warm smile and greet first. In addition to generating a warm and friendly atmosphere, officers must also be willing to listen to their customers' complaints and to formulate the best solution to them.

The importance of the combination of financial security and the friendliness of staff supports the findings of Echchabi and Nafiu Olaniyi (2012), who stated that a bank's hospitality, quality and assurance of security were the main factors considered by customers when choosing their bank. So, customers prefer to be served by friendly staff who are responsive, flexible and competent. This service should be enhanced by clean and comfortable premises with an Islamic atmosphere. Echchabi and Nafiu Olaniyi (2012) also found that the friendliness of bank personnel (called service quality) and convenience were regarded as key factors by customers.

This research has demonstrated that the attribute of Islamic principles (item A1 with LVI = −0.81) is also at the forefront of customers' minds when they select an Islamic bank. However, this finding contradicts that of Echchabi and Nafiu Olaniyi (2012), who claimed that this attribute was the one considered the least by customers when selecting an Islamic bank. That is why Islamic banks should aim to convince the public that their operation is governed by Islamic principles, with a relevance to both Muslim and non-Muslim customers. In order to increase the size of their potential market, it is important that non-Muslim customers are persuaded by Islamic banks that the Islamic principles applied in their operations are beneficial to them. This is feasible, because Setiawan *et al.* (2015) found that the non-Muslim people in Indonesia rate this attribute highly.

The attribute of profit and loss sharing (item A2 with LVI = 0.12) is also considered by the community when selecting an Islamic bank. This result is in line with that obtained by Amin *et al.* (2013), namely that if Muslims want to invest in a business venture, they expect to do so as partners, sharing both the risk (loss) and the profit.

The results show that the respondents do not consider transaction fees to be of much importance (LVI = 0.74). This is may be because they believe that the transaction fees charged by Islamic and conventional banks are the same. Likewise, the community gives little consideration to the variety of products offered by Islamic banks (LVI = 0.92). Perhaps this is because the respondents do not have adequate knowledge about the range of products offered by Islamic banks. The community is aware of the savings products, deposits and financing schemes of Islamic banks, but not of various other products offered (Setiawan *et al.*, 2015). This lack of awareness of the variety of products offered would suggest that Islamic banks have not fully promoted their products to the public. The community does not attach much importance to the CSR program operated by the banks (LVI = 1.17). Ideally, the CSR program should improve the image of Islamic banks. So, although the community takes into account the good image of Islamic banks in terms of the latter's Islamic principles, it does not do the same in relation to the CSR program. This indicates that Islamic banks need to do more to promote CSR via public relations and publicity.

The degree to which the different attributes of Islamic banks are preferred by individuals in the community will influence their perception of the degree of conformity between the

actual and expected quality of the attributes. Every 1 logit increase in the value of preference will be followed by an increase in the agreement between the actual and expected performance of attributes of 0.199 logit. The odds ratio is bigger amongst respondents who stated that the performance of the attributes agreed with their expectations. This value is 1.220 times bigger compared to the odds ratio of those who stated that the performance of the attributes did not agree with their expectations (for each increase of the logit score of the preferred attributes). This finding proves, by an empirical test, that the preferred attributes of the community are indeed the ones most important to them when they select an Islamic bank. Therefore, in order to prosper, Islamic banks need to improve the quality of their customer service.

Conclusion

The objective of this research was to investigate the degree to which the different attributes of Islamic banks in Indonesia are preferred by the community. The measurement of the preferred attributes was done by Rasch analysis, and the results of instrument analysis showed that this is a reliable means of measurement: one well-suited to the required criteria. An increase in the community's preference for a particular attribute will eventually be followed by an increased agreement between the actual performance of that attribute and the community's expectation.

The assurance of financial safety, friendly service and the application of Islamic principles to operations are the most important attributes considered by customers when selecting an Islamic bank. Consequently, Islamic banks must ensure that their operations give assurance to their customers; they run the business according to Islamic principles; and they offer a high quality of service oriented to the satisfaction of their customers.

The image of Islamic banks is enhanced by operating according to Islamic principles. In contrast, the banks' CSR programs do not have the same effect. Considering this, Islamic banks must try to optimize the role of customer relations by giving information about all of their social activities via "advertorial" coverage or combined with an advertisement. This advertisement should contain information about the CSR activities conducted by the bank, together with an invitation to the community to engage with it and to support its success. In addition, the advertisement could also be combined with information about the range of products and services offered by the Islamic bank. Hence, not only will there be an improvement in the community's awareness of the CSR activities undertaken by the bank, there will also be an increased understanding by the community of the range of products and services available from the bank.

The implications of this research for both the managers of Islamic banks and the government (via the OJK) are that the community's awareness of and preference for Islamic banks should be increased by means of integrated programs amongst stakeholders. Another implication for managers is the necessity for Islamic banks to improve their quantity and quality of human resources; systematization of service; and infrastructure. The dynamic of customers' behavior should be anticipated by relevant prime service management, customization of the products offered and feedback from the community.

It is recommended that future research should explore the profiles of the customers of Islamic banks. This would produce valuable information about the segment of the market targeted by the banks, thus enabling an appropriate marketing mix to be developed. Another avenue for future research should be to combine both quantitative and qualitative analysis and analyze the results with a view to minimizing the possibility of bias in understanding the measurement of instruments.

References

Ahmad, A., Saif, I. and Safwan, N. (2010), "An empirical investigation of Islamic banking in Pakistan based on perception of service quality", *African Journal of Business Management*, Vol. 4 No. 6, pp. 1185-1193.

Al-Ajmi, J., Abo Hussain, H. and Al-Saleh, N. (2009), "Clients of conventional and Islamic banks in Bahrain", *International Journal of Social Economics*, Vol. 36 No. 11, pp. 1086-1112.

Amin, M., Isa, Z. and Fontaine, R. (2013), "Islamic banks: contrasting the drivers of customer satisfaction on image, trust, and loyalty of Muslim and non-Muslim customers in Malaysia", *International Journal of Bank Marketing*, Vol. 31 No. 2, pp. 79-97.

Bond, T.G. and Fox, C.M. (2015), *Applying the Rasch Model: Fundamental Measurement in the Human Sciences*, 3rd ed., Routledge, New York, NY.

Boone, W.J., Staver, J.R. and Yale, M.S. (2014), *Rasch Analysis in the Human Sciences*, Springer, New York, NY.

Echchabi, A. and Nafiu Olaniyi, O. (2012), "Malaysian consumers' preferences for Islamic banking attributes", *International Journal of Social Economics*, Vol. 39 No. 11, pp. 859-874.

Engelhard, G. Jr (2013), *Invariant Measurement: Using Rasch Models in the Social Behavioral, and Health Sciences*, Routledge, New York, NY.

Estiri, M., Hosseini, F., Yazdani, H. and Javidan Nejad, H. (2011), "Determinants of customer satisfaction in Islamic banking: evidence from Iran", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 4 No. 4, pp. 295-307.

EY (2016), "World Islamic banking competitiveness report 2016: new realities new opportunities", available at: www.ey.com/Publication/vwLUAssets/ey-world-islamic-banking-competitiveness-report-2016/$FILE/ey-world-islamic-banking-competitiveness-report-2016.pdf (accessed July 23, 2017).

Financial Services Authority of the Republic of Indonesia (OJK) (2015a), "Indonesian Islamic banking roadmap 2015-2019", Jakarta, available at: www.ojk.go.id/id/kanal/syariah/berita-dan-kegiatan/publikasi/Documents/roadmap-pbs_2015-2019.pdf

Financial Services Authority of the Republic of Indonesia (OJK) (2015b), "Sharia banking statistics", Jakarta, available at: www.bi.go.id/id/statistik/perbankan/syariah/Documents/SPS%20Juni%202015.pdf

Fraser, B.J. and Dorman, J.P. (2011), *Applications of Rasch Measurement in Learning Environments Research*, Vol. 2, Sense Publishers, Rotterdam.

Gwin, C.F. and Gwin, C.R. (2003), "Product attributes model: a tool for evaluating brand positioning", *Journal of Marketing Theory and Practice*, Vol. 11 No. 2, pp. 30-42.

Indonesian Deposit Guarantor Institution (2010), Decree of the Indonesian Deposit Guarantor Institution No. 2/PLPS/2010, Jakarta, available at: www.lps.go.id/documents/10157/182852/2010.PLPS+No2+Th+2010+ttg+Program+Penjaminan+Simpanan.pdf

Johnston, R. (1997), "Identifying the critical determinants of service quality in retail banking: importance and effect", *International Journal of Bank Marketing*, Vol. 15 No. 4, pp. 111-116.

Kamarulzaman, Y. and Madun, A. (2013), "Marketing Islamic banking products: Malaysian perspective", *Business Strategy Series*, Vol. 14 Nos 2/3, pp. 60-66.

Kemal Avkiran, N. (1994), "Developing an instrument to measure customer service quality in branch banking", *International Journal of Bank Marketing*, Vol. 12 No. 6, pp. 10-18.

Khan, F. (2010), "How "Islamic" is Islamic banking?", *Journal of Economic Behavior and Organization*, Vol. 76 No. 3, pp. 805-820.

Khan, G.M., Amine, L.S., Uddin, S.J. and Zaman, M. (2011), "The internationalization of an Arab bank: the case of Ahli United Bank of Bahrain", *Thunderbird International Business Review*, Vol. 53 No. 5, pp. 581-600.

Khan, M.S.N., Hassan, M.K. and Shahid, A.I. (2008), "Banking behavior of Islamic bank customers in Bangladesh", *Journal of Islamic Economics, Banking and Finance*, Vol. 3 No. 2, pp. 159-194.

Khattak, N.A. and Rehman, K.-U. (2010), "Customer satisfaction and awareness of Islamic banking system in Pakistan", *African Journal of Business Management*, Vol. 4 No. 5, pp. 662-671.

Linacre, J.M. (2012), "A user's guide to Winsteps Ministeps Rasch-model computer programs (version 3.74.0)", available at: www.winsteps.com/index.htm (accessed July 23, 2017).

Moon, S.-Y., Philip, G.C. and Moon, S. (2011), "The effects of involvement on e-satisfaction models", *Services Marketing Quarterly*, Vol. 32 No. 4, pp. 332-342.

Nguyen, N. and Leclerc, A. (2011), "The effect of service employees' competence on financial institutions' image: benevolence as a moderator variable", *Journal of Services Marketing*, Vol. 25 No. 5, pp. 349-360.

Okumus, S. and Genc, E.G. (2013), "Interest free banking in Turkey: a study of customer satisfaction and bank selection criteria", *European Scientific Journal*, Vol. 9 No. 16, pp. 144-166.

Osman, I., Alwi, S.F.S., Mokhtar, I., Ali, H., Setapa, F., Muda, R. and Rahim, A.R.A. (2015), "Integrating institutional theory in determining corporate image of Islamic banks", *Procedia – Social and Behavioral Sciences*, Vol. 211, pp. 560-567.

Sangeetha, J. and Mahalingam, S. (2011), "Service quality models in banking: a review", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 4 No. 1, pp. 83-103.

Setiawan, B., Puspitasari, R. and Manurung, T.M.S. (2015), "The existence of Islamic banking in Indonesia from non-muslims perceptions", *ASEAN Marketing Journal*, Vol. 7 No. 2, pp. 81-96.

Solomon, M., Russell-Bennett, R. and Previte, J. (2012), *Consumer Behaviour*, Pearson Higher Education AU, New South Wales.

Sumintono, B. and Widhiarso, W. (2014), *Aplikasi Model Rasch untuk Penelitian Ilmu-Ilmu Sosial (edisi revisi) (Application of Rasch Modelling in Social Science Research, Revised Edition)*, Trimkom Publishing House, Cimahi.

Sumintono, B. and Widhiarso, W. (2015), *Aplikasi Pemodelan Rasch pada Assessment Pendidikan (Application of Rasch Modelling in Educational Measurement)*, Trimkom Publishing House, Cimahi.

Wulandari, D. and Subagio, A. (2015), "Consumer decision making in conventional banks and Islamic bank based on quality of service perception", *Procedia – Social and Behavioral Sciences*, Vol. 211, pp. 471-475.

Further reading

Financial Services Authority of the Republic of Indonesia (OJK) (2017), "Sharia banking statistics", Jakarta, available at: www.ojk.go.id/id/kanal/syariah/data-dan-statistik/statistik-perbankan-syariah/Documents/Pages/Statistik-Perbankan-Syariah—November-2016/SPS%20November%202016.pdf

Haque, A., Osman, J. and Ismail, A.Z.H. (2009), "Factor influences selection of Islamic banking: a study on Malaysian customer preferences", *American Journal of Applied Sciences*, Vol. 6 No. 5, pp. 922-928.

Khan, H.N. and Asghar, N. (2012), "Customer awareness and adoption of Islamic banking in Pakistan", *Interdisciplinary Journal of Contemporary Research Business*, Vol. 3 No. 9, pp. 359-366.

Osayawe Ehigie, B. (2006), "Correlates of customer loyalty to their bank: a case study in Nigeria", *International Journal of Bank Marketing*, Vol. 24 No. 7, pp. 494-508.

Appendix. Questionnaire

Respected respondents

In order to measure the attributes of communities preferences in selecting the Islamic banking, we would like to ask your participation to fill in this questionnaire. Your answer to this questionnaire will be used for academic purposes only, not for profit-oriented purposes. For closed-ended questions, you are only allowed to select one of the available options. For the open-ended questions, you are allowed to give an answer by your own words, based on the true conditions.

We appreciate very much your participation in this research.

1. Gender:
  □ Male
  □ Female

2. Age:
  □ < 20 years old
  □ 20 – 29 years old
  □ 30 – 39 years old
  □ 40 – 50 years old

3. Domicile
  □ City _____ *(please state)*
  □ Village _____ *(please state)*

4. Religion
  □ Muslims
  □ Others _____ *(please state)*

5. Have you had any experience of doing financial transaction in the Islamic Bank?
  □ Yes
  □ No

6. Do you have an account at the Islamic Bank?
  □ Yes
  □ No

7. What is the proportion of your income allocated to be saved in the bank?

  □ < 5% of income
  □ 5 – 10% of income
  □ 10 – 20% of income
  □ > 20% of income

8. When selecting the Islamic Bank, how do you consider the following attributes?

Constructs	Items	Consideration				
		Strongly considered	Considered	Fairly considered	Less considered	Not considered
Religious & Islamic Reputation	Banking operational referring to the application of Islamic values					
	A righteous and non-interest profit-sharing-system					
	The bank's image in the community					
	The bank's social responsibility to the community					

Constructs	Items	Consideration				
		Strongly considered	Considered	Fairly considered	Less considered	Not considered
Information technology	The bank's network					
	The support of information technology based transaction					
	The availability of sufficient communication with the customers					
Physical evidence	The Islamic atmosphere of the service room (area)					
	The comfort of the service room (area)					
	The cleanliness of the service room (area)					
	The accessibility to the location of the bank					
Services	Flexibility					
	The competence of the service officers					
	The hospitality of the service officers					
	The promptness of service					
	The security assurance of deposits and financial transactions					
Product	The variety of products offered					
	The transaction administration charges					

Has the current performance of the Islamic banking fulfilled your expectation?
□ Yes
□ No

Please describe your opinion about the overall performance of the Islamic Banking in Indonesia
_____
_____
_____
_____
_____
_____
_____
_____
_____

Thank you for your participation

Corresponding author
Budi Setiawan can be contacted at: budisetiawan@stiekesatuan.ac.id