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### Satisfaction Drivers in Sharia Banking: Comparison PLS-SEM and CB-SEM

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#### Abstract

In investigating satisfaction drivers which involving latent variables, the application of Covariance Based-SEM/LISREL usually used as the parameter estimation approach. However, many researchers do not pay enough attention to the adequacy of the data in meeting the estimated requirements with the Maximum Likelihood method to obtain a suitable solution in LISREL modeling. PLS appears as an alternative to Structural Equation Modeling analysis that does not require a large sample size to produce the proper solution. The purpose of this study is to examine the factors driving satisfaction in sharia banking using PLS and SEM. The satisfaction model used involve latent variables which is Islamic Product Attributes, Religious Commitments, Service Quality, Trust, Satisfaction and Loyalty. Data was collected by use a 1-to-5 rating scale questionnaires to 209 bank customers of **bjb** sharia bank (**BJBS**) in Bandung. The results of the comparison of the use of these two approaches show that the estimation result of CB-SEM loading factor is higher than PLS-SEM, while the estimation for the path coefficient with PLS-SEM is higher than CB-SEM. By using both methods, the most important and significant factor in increasing the satisfaction of sharia bank customers is Trust

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Keywords: Satisfaction; Loyalty; Sharia Banking; PLS-SEM; CB-SEM

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## 1. Introduction

In the last few years SEM has become a popular statistical tool in uncovering relationships between latent variables that are not possible by statistical tools such as regression analysis, ANOVA or MANOVA. As is known SEM analysis is a combined analysis of measurement models (factor analysis) and structural models (regression analysis). This combined analysis allows measurement errors of observed variables to be analyzed as an overall part of the model (Gefen et al., 2000). Researchers who apply SEM can choose between covariance-based analysis (CB-SEM) or variance-based approach, known as partial least squares (PLS-SEM) (Gefen et al., 2000; Hair, Sarstedt, Ringle, & Mena, 2012).

Each approach has different assumptions and goals. CB-SEM is a type of SEM that requires its constructs and indicators to correlate with each other in a structural model. While PLS-SEM is a type of SEM that uses variance in the iteration process so that it does not require a correlation between the indicator and its latent variables in a structural model. In general, the use of CB-SEM aims to estimate the structural model based on a strong theoretical study to examine the causality relationship between constructs or latent variables and measure the feasibility of the model and confirm it according to the empirical data. Consequently the use of CB-SEM is demanding a strong theoretical basis, fulfilling various parametric assumptions and fulfilling the goodness of fit model. Therefore CB-SEM is very appropriate to be used to test the theory and get justification for the test with a series of complex analyzes.

While PLS-SEM aims to test the predictive relationship between constructs. The consequence of using PLS-SEM is that testing can be done without a strong theoretical basis, ignoring some assumptions (non-parametric) and measuring the accuracy of predictive models as seen from the value of the coefficient of determination (R-square). Because of that PLS-SEM is very suitable for use in research aimed at developing theory.

So it can be concluded that, if the structural model and measurement model hypothesized correctly in this case explain the covariance of all indicators and data conditions or the number of samples can be met, then covariance based SEM provides an optimal estimate of the model parameters. However, if the goals and views of the researcher from data to theory, the number of samples is limited and cannot meet various parametric assumptions, PLS is a suitable analytical technique.

The main objective of this research is to test whether there are differences between PLS-SEM and CB-SEM. Research on comparisons between statistical techniques is very valuable for researchers to have guidelines on which statistical techniques can be more useful and valuable for their research (Goodhue, Lewis and Thompson, 2012).

Knowing what drives customer satisfaction has become an important discussion in many marketing literature (Anderson, H, et. Al (2000), Bontis, N, et. al (2007), and Housemark, et. al (2004)). In theory, factors that affect customer satisfaction can differ in various countries and sectors that cannot be generalized. In Indonesia, despite the importance of customer satisfaction and the growth of the banking sector, especially sharia banking, empirical research to investigate what determines customer satisfaction in this important industry is still low. Customer satisfaction holds an important meaning in the development of the banking sector, but the inability of several banks to determine what drives their customers' behavior can lead to customer switching which can also affect the bank's ability to increase business growth in the future. This is because it shows that dissatisfaction drives customers away and is a key factor in customer switching behavior. (Ibok, et.al (2009), Akpan, I, M (2010), and Kotler, P (2000). Factors driving customer satisfaction vary in the literature and there is no one generally accepted factor that can explain what satisfies customers or not, because customer satisfaction differs between sectors and regions (Almossawi, M. (2000) and Alfred, T. A., et.al (2000)).

Many studies have been conducted to determine the factors that influence customer satisfaction and loyalty. One factor that influences the creation of customer satisfaction is the quality of service (Mosahab, et al, 2010;

and Hasanah, 2013). According to Webster's Dictionary in Andespa (2016: 143-159) the concept of consumer satisfaction is the result of the success of product providers meeting consumer expectations. and definitively influences changes in attitude, repurchase and loyalty. Service quality is one of the important attributes in the service industry, such as banking, in addition to security and certainty issues, as well as prices (which correspond to quality). Quality service is of course not limited to a friendly smile from tellers or customer service, but more than that. According to Andespa (2016: 143-159) The quality of service in the banking industry is determined by the assessment of its customers, so that customer satisfaction can be achieved by providing quality services that can be received by customers. Further explained by Andespa, having satisfied customers is very important for the banking industry, because this industry has high-contact service characteristics and a very high level of competition. Satisfied customers will encourage the creation of public publicity to prospective new potential customers, and at the end will result in loyal customers.

The next factor that influences the creation of customer satisfaction is trust (Danesh, et al, 2012; Elsandra and Efriyuzal, 2013; and Junusi, 2009). According to Danesh, et al, (2012), in social exchange theory, states that consumers who do not believe will have a direct influence on satisfaction after they make a purchase. Therefore, it can be argued that perceptions of trust will affect satisfaction over time. In addition to these service factors, there are also factors: Islamic product attributes that have Islamic nuances offered by banks and religious commitment factors (Junusi, 2009)

## 2. Empirical Data

To compare CB-SEM and PLS-SEM, the model applied in this study is a model from Junusi (2009). Their model examines the Influence of Islamic Product Attributes, Religious Commitments, Service Quality and Trust in the Customer Satisfaction and Loyalty of Shariah Banks. Based on the model built above, the proposed hypothesis is as follows:

H1: The higher the level of distinctiveness of Islamic attributes on shari'ah bank products, the higher the satisfaction that customers feel

H2: The higher the level of customer religious commitment, the higher the satisfaction he feels

H3: The better the customer's perception of the quality of service, the higher the perceived satisfaction

H4: The higher the level of customer trust, the higher the satisfaction he feels

H5: The better the customer satisfaction, the higher the quality.

The conceptual model and hypotheses is exhibited in Figure 1.

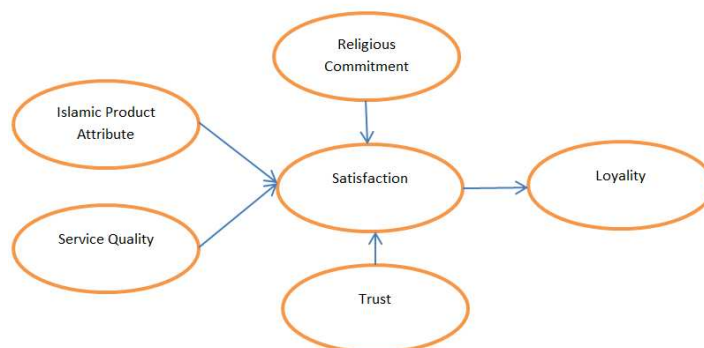


Figure 1. Conceptual Model

The scales used for the self-administered questionnaires were selected from literature (see Table 1)

Table 1. Construct and Indicator

Construct		Indicator
Islamic Product Attributes	x11	Islamic Bank products avoid elements of usury
	x12	Investment results of <b>bjb Sharia Bank</b> Products are divided according to profit sharing
	x13	Islamic Bank products avoid elements of uncertainty (gharar)
	x14	Islamic Bank products avoid elements of gambling / gambling (maisir)
	x15	Islamic Bank products make halal investments
Religious Commitment	x21	I often visit places of worship
	x22	I often participate in religious activities
	x23	The level of my religious beliefs is very high
	x24	Can increase awareness of Islamic values by implementing sharia rules
	x25	Can get peace of mind
Trust	x31	Islamic banks are highly trusted banks
	x32	Islamic banks understand my needs
	x33	Islamic banks are recommended by my friends and family
	x34	Islamic Banks are banks that are close to their customers
	x35	Islamic Banks provide services that are used by people I respect (eg: scholars)
Service Quality	x41	Islamic banks always provide information that is right when performing services
	x42	Fast service by bank employees
	x43	Islamic banks guarantee the security of customers in conducting transactions
	x44	Bank employees are always ready to accept customer complaints
	x45	The physical appearance of buildings and employees is neat and attractive
Satisfaction	Y1	Recommend the quality of Islamic banks.
	Y2	Talk about positive things about Islamic banks
	Y3	Sharia banks are ideal Islamic banks
	Y4	I am satisfied with Sharia Bank service
	Y5	Sharia banks are the best Islamic banks in my opinion
	Y6	Sharia banks meet the expectations of the needs of banks that implement sharia
Loyalty	Z1	Stay loyal even though conventional banks offer attractive interest.
	Z2	Will not switch to another bank.
	Z3	Opportunities to stay afloat with Islamic banks

### 3. Research Finding

In the CB-SEM approach to the Satisfaction Model in Figure 1, confirmatory factor analysis is performed on indicators using Full Information Maximum Likelihood (FIML) in Lisrel 8.7 to assess the validity of measurement items (Jöreskog & Sörbom, 1996). In the PLS-SEM approach, the first part in evaluating the

model is checking the reliability and validity of the external model (Chin, 2010). PLS analysis in this study was carried out using SmartPLS 2.0 (Ringle, Wende, & Will, 2005). Evaluation aims to: (1) determine that the measurement model is adequate (in terms of reliability and validity), (2) obtain an estimate of the path coefficients in the structural model, and (3) determine the statistical significance of the estimated path coefficient. Examination of latent variables includes reliability of indicators, internal consistency reliability, convergent validity and discriminant validity, as explained by Hair et al. (2011), Hair, Sarstedt, et al. (2012) and Henseler, Ringle, and Sinkovics (2009). Table 2 presents the results obtained using two approaches.

Table 2. Reliability and Convergen Validity Result

Construct		Loading		Cronbach Alpha	Composite Reliability		AVE	
		SEM	PLS		PLS	SEM	PLS	SEM
Islamic Product Attributes	X1.1	0,89	0,90	0,94	0,94	0,94	0,81	0,79
	X1.2	0,89	0,91					
	X1.3	0,84	0,90					
	X1.4	0,89	0,90					
	X1.5	0,94	0,90					
Religious Commitment	X2.1	0,84	0,88	0,92	0,92	0,92	0,76	0,69
	X2.2	0,84	0,83					
	X2.3	0,85	0,90					
	X2.4	0,87	0,87					
	X2.5	0,77	0,89					
Trust	X3.1	0,77	0,83	0,85	0,89	0,85	0,63	0,44
	X3.2	0,66	0,81					
	X3.3	0,62	0,75					
	X3.4	0,6	0,82					
	X3.5	0,66	0,75					
Service Quality	X4.1	0,67	0,86	0,90	0,93	0,91	0,72	0,51
	X4.2	0,58	0,82					
	X4.3	0,84	0,87					
	X4.4	0,8	0,86					
	X4.5	0,66	0,84					
Satisfaction	Y1	0,66	0,79	0,90	0,92	0,90	0,66	0,45
	Y2	0,74	0,83					
	Y3	0,72	0,87					
	Y4	0,73	0,85					
	Y5	0,6	0,80					
	Y6	0,6	0,75					
Loyalty	Z1	0,8	0,75	0,68	0,79	0,70	0,56	0,38
	Z2	0,5	0,54					
	Z3	0,49	0,92					

Internal consistency was measured through Cronbach's Alpha score and composite reliability (CR) which was considered reliable if it was valued more than 0.7 (Hair et, al. 2011). CR for Loyalty shows a value of less than 0.7 which means that the indicators are less reliable in measuring the Loyalty construct.

The solution to overcome the AVE value that is less than 0.5 is to eliminate the indicator with the smallest loading to be subsequently carried out by repeated factor analysis, until the AVE obtained above 0.5 or the indicator reaches 2 items. If until the remaining 2 items do not make the construct reach convergent validity, the construct remains in use with the risk of the relationship between the constructs could be biased. Estimated path coefficients in both approaches are presented in Table 3. All hypotheses were tested, using both methods. The path coefficient resulted by PLS-SEM is higher than CB-SEM. Likewise with the critical t value, PLS produces a non-significant path coefficient, only the Satisfaction→Loyalty path, while CB-SEM produces all path coefficients are not significant except Trust→Satisfaction path.

Table 3. Path Coefficient Estimate

Direct Effect	Path Coefficient		Statistic-t	
	PLS	SEM	PLS	SEM
Islamic Product Attributes --> Satisfaction	0,15	0,05	1,22	0,38
Religious Commitment --> Satisfaction	0,21	0,21	1,66	1,69
Trust --> Satisfaction	<b>0,36</b>	<b>0,51</b>	<b>3,80</b>	<b>3,57</b>
Service Quality--> Satisfaction	0,16	0,11	1,41	0,95
Satisfaction--> Loyalty	-0,21	-0,21	-0,98	-1,25

For structural models, the estimation of the path coefficients is slightly different, except for one path that shows a considerable difference, which is Trust→satisfaction path. Both methods generate t-statistic's value more than 1.96 only Trust → Satisfaction path.

Table 4. R-Square

Construct Endogenous	PLS R <sup>2</sup>	SEM R <sup>2</sup>
Satisfaction	0,63	0,69
Loyalty	0,04	0,04

Based on the R squared value, the estimated value obtained from SEM is higher for satisfaction than the R squared value of PLS estimation results, this shows that SEM estimates can perform better than PLS in generating estimated variance that can be explained by exogenous latent variables

#### 4. Conclusion

Comparison of the use of PLS SEM and CB SEM in analyzing models can be seen from the measurement model coefficients and structural model coefficients. The data used is not normally distributed, which is usual when using rating scales, so estimates are expected to be biased. The measurement model coefficient obtained by PLS-SEM is higher than that obtained by CB-SEM. This finding is consistent with the statement of Vilares, Almeida and Coelho (2005) in Monika (2009) that estimates with PLS-SEM tend to produce

overestimate measurement model coefficients and underestimate structural model coefficients. The opposite applies to estimates with CB-SEM.

Based on the structural model coefficient we can assess the hierarchy of satisfaction drivers. The first place in this hierarchy is Trust, with t-statistic is more than 1.96, which means that there is a significant influence from Trust on Satisfaction. Although the influence of other variables is not significant to Satisfaction, according to the hierarchy of measurement model coefficients, Religious Commitment is the second most important sequence as a satisfaction driver, followed by Service Quality as the third and the last order is Islamic Product Attributes. This result is not exactly what is expected due to many limitations, therefore we must be careful in making interpretation. The smaller sample size may produce different results.

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