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https://www.emerald.com/insight/0128-1976.htm

Received 6 August 2018
Revised 21 November 2018
23 May 2019
24 May 2021
13 June 2021
Accepted 14 June 2021

Validity of zakat ratios as Islamic performance indicators in Islamic banking: a congeneric model and confirmatory factor analysis

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Abstract

Purpose – This paper considers zakat (Islamic tax) as an alternative indicator to measure the performance of Islamic banks (IBs). It aims to examine whether zakat ratios can be used as Islamic performance (ISPER) indicators for IBs besides the conventional performance (COPER) indicators.

Design/methodology/approach – The investigation covered a sample of 214 yearly observations of 37 IBs located in Indonesia, Malaysia, Bahrain, Saudi Arabia and the United Arab Emirates for the period 2007–2015. This study used a single-factor congeneric model and confirmatory factor analysis, performed using the AMOS 23.0 software.

Findings – The findings assert that the discriminant validity of multi-bank performance, as measured by ISPER [zakat on assets (ZOA) and zakat on equity (ZOE)] and COPER indicators (return on assets, return on equity and operational efficiency in terms of assets), is very high. Hence, ISPER and COPER measurements are valid, either together to measure the multi-performance of IBs from both the Islamic and conventional perspectives, or independently as each measurement is valid to measure the Islamic and conventional performance if it is used separately.

Research limitations/implications – This paper does not investigate whether the findings are constant across time. This represents one of the limitations of this study.

Practical implications – It is strongly recommended that IBs calculate and disclose zakat ratios, particularly ZOA and ZOE, in their annual reports. Researchers and academicians should use these ratios for measuring the ISPER of IBs, either along with COPER or separately.

Originality/value – Empirical evidence is provided in this paper on the development and validity of zakat ratios as ISPER indicators in the Islamic banking industry. Zakat ratios are suitable indicators that can measure IBs' performance and achieve the goals of IBs as well as those of Islamic economics.

Keywords Confirmatory factor analysis, Islamic banks, Islamic performance measurement, Single-factor congeneric model, Zakat ratios

Paper type Research paper

ISRA International Journal of Islamic Finance
Vol. 14 No. 1, 2022
pp. 38-58
Emerald Publishing Limited
e-ISSN: 2289-4365
p-ISSN: 0128-1976
DOI 10.1108/IJIF-08-2018-0088

Introduction

Islamic banks (IBs) are significantly different from their conventional counterparts as IBs have different operating mechanisms that mainly rely on the Islamization process (Grassa, 2013; Nomran and Haron, 2021). In this context, conventional banks' (CBs) performance measurements are not suitable to measure the performance of IBs. The majority of prior studies used the conventional performance (COPER) measurements to measure the performance of IBs instead of using Islamic performance (ISPER) indicators (Mohammed and Muhammed, 2017).

Providing a measurement indicator of ISPER is crucial for ethical and marketing reasons. From an ethical viewpoint, Islamic finance can play an important role in addressing the challenges of alleviating extreme poverty and boosting shared prosperity (Bhatti and Alam, 2018). Indeed, the goals of IBs are guided by the primary goal of Islamic economics which is to achieve economic well-being (Mohammad and Shahwan, 2013). In this context, as argued by Mohammed and Muhammed (2017), IBs must pay zakat (Islamic tax) annually as Sharīʿah principles include imposition of zakat on Muslims. This imposition includes Muslims as individuals and business entities. According to Abbas *et al.* (2018), "the responsibility to pay zakat lies not only on Muslim individuals but also to businesses. Business activity is one of the ways to accumulate wealth, and it is subjected to zakat" (p. 71). It is thus an obligation for all Muslims to pay zakat, including firms that are owned by Muslims (Tuan Ibrahim *et al.*, 2020).

Overall, IBs must make sure that their operations and transactions are differentiated from those of CBs and bring benefits to and promote the welfare of the society (Mohammed and Muhammed, 2017). Their performance needs to be assessed based on an indicator that reflects their Sharīʿah-based operations. For instance, zakat ratios could be one of the indicators of their financial performance.

Providing an ISPER measurement is also important for marketing reasons, especially with the increasing debate that IBs are identical copies of CBs. Tahiri Jouti (2020), for example, indicates that IBs apply the same mechanisms used by CBs such as using interest rates as a base to determine profit rates. Logically, measuring IBs' performance based on ISPER is important as IBs operate on the basis of Sharīʿah principles, and thus, equivalent Sharīʿah-based indicators would be most appropriate to measure their performance. From the marketing point of view, having a measurement indicator of ISPER would help meet the expectations of IBs' stakeholders, especially those with religious concerns, thus enhancing customers' trust of IBs. Indeed, if customers believe that IBs do not operate based on Sharīʿah principles and do not differ from CBs, they may want to withdraw their deposits, which may lead to a widespread loss of trust in the whole banking sector (Mansour and Bhatti, 2018). Regarding this, Abdul Hadi and Muwazir (2020) found that the religious motivation for Malaysian Muslim customers positively affects their decisions to choose IBs.

However, the question on how the performance of IBs should be measured is a subject of much debate (Mohammed and Muhammed, 2017; Hudaefi and Noordin, 2019). Nevertheless, there is a noticeable shortage of empirical studies attempting to develop and validate measurement constructs of ISPER in the Islamic banking industry, creating a gap in the literature. Responding to that, this study aims to empirically examine the extent to which zakat ratios are valid for use as measurement indicators of ISPER, thus contributing to the literature. There are many reasons for the selection of zakat ratios as a measurement of Islamic performance. From a technical perspective, zakat has the ability to reflect the profitability of IBs. In addition, the greater the total assets of IBs, the higher the amount of zakat that they should pay. Zakat ratios can thus be used as profitability measurements as in the case of tax ratios.

This paper is organized as follows. The first section presents the background of the study and the related literature review. The second section outlines the data and methodology, whereas the third section discusses the empirical results. The conclusion of the research is provided in the last section.

Literature review

According to Mohammed and Taib (2016), the current COPER measurements being used by IBs have focused largely on financial measures, meaning that many IB stakeholders cannot clearly see the difference between IBs and CBs. Besides that, COPER measurements cannot reflect the wider objectives of IBs. This is in line with the argument of Hudaefi and Noordin (2019), who criticized COPER measurements owing to their limitation in reflecting Sharīʿah aspects of Islamic banking activities. Given that, Hudaefi and Noordin (2019) argued, "IBs' performance should be measured by considering not only their financial aspects but also their religious features" (p. 283). Therefore, there is a need to develop other performance measurements that would complement the financial objectives of IBs (Mohammed and Taib, 2016). In other words, the performance of IBs should be measured by using a Sharīʿah approach such as zakat ratios (Nomran and Haron, 2020a). It has been suggested by many studies that zakat is an alternative measurement of Islamic performance (Ibrahim *et al.*, 2004; Mohammed and Muhammed, 2017; Nurkhin *et al.*, 2018; Nomran and Haron, 2019; Nomran and Haron, 2020a; Haron *et al.*, 2021a; Haron *et al.*, 2021b). Zakat is a key pillar in Islam and an obligation that must not be neglected. IBs are not exempted from the zakat obligation – an obligation which is met upon the approval of their Sharīʿah supervisory boards (Mohammed and Muhammed, 2017). This means that investment sources such as deposits and deposit returns are subject to zakat at 2.5% (Naser and Pendlebury, 1997).

The key principle of an Islamic business should be to emphasise social welfare, but in practice profit maximisation remains the overriding motive (Safiullah and Shamsuddin, 2019). In this context, Alhammadi *et al.* (2020) claim that IBs theoretically operate to achieve the aim of fulfilling socio-economic objectives; however, in the current practice the priority for IBs is to maximize profit. However, Mohammed and Muhammed (2017) believe that IBs give more emphasis on Islamic values, particularly justice in society, as compared to profit. They conclude that banks' goals are affected by the Islamic values as zakat aims to enhance justice and wealth and reduce poverty. This is not surprising owing to the fact that the goals of IBs are guided by the Islamic economics goals, especially in achieving economic well-being based on the moral norms of Islam, including ensuring justice and equitable distribution of income (Mohammad and Shahwan, 2013). Zakat is a key financial tool that aims to improve social welfare by redistributing wealth from the wealthy to the needy (Choudhury and Hassan, 2016). It is widely believed that zakat is not only restricted to the scope of Sharīʿah studies but also includes the issue of social economics (Adnan and Abu Bakar, 2009). From this perspective, zakat can be used as a suitable measurement of IBs' performance as it is closely guided by the Sharīʿah principle in achieving IBs' goals and the Islamic economics goals as a whole.

Technically, there are several reasons why zakat paid by IBs can be a suitable and reliable measurement indicator of their performance. The first reason lies in zakat's dynamic ability to reflect the profitability status and the health of IBs – the more the IBs generate profit, the more they pay zakat (Mohammed and Muhammed, 2017; Sarif and Kamri, 2012). The second reason is that the greater the total assets of IBs, the higher the amount of zakat that they should pay (Adnan and Abu Bakar, 2009). Third, as Albertazzi and Gambacorta (2010) assert, one of the profitability measurements is the tax ratio, which is calculated as tax paid to total assets. Zakat differs from tax in some points. Zakat is an Islamic order, whereas tax is a government order; and zakat aims to meet the needs of the poor, whereas tax aims to meet the expenditures of the society as a whole (Mustapha and Sapiei, 2005). In spite of these differences, zakat and tax are treated as expenses in an institution's income statement (Adnan and Abu Bakar, 2009). Some might go beyond this accounting view and argue that zakat payment is no different from taxation in the Western context (Velayutham, 2014). This justifies why, in some studies, zakat is defined as an Islamic tax (Nurkhin *et al.*, 2018) or as religious tax in some others (Naser and Pendlebury, 1997; Velayutham, 2014; Ben Jedidia and Guerbouj, 2021) or as alms tax (Umar and Kurawa, 2019). This is in support of Choudhury and Hassan (2016), who claim that zakat is essentially a tax levied on wealth. Thus, zakat can be used as a profitability measurement as are tax ratios.

By reviewing the existing Islamic economics literature on *maqāṣid al-Sharīʿah* (objectives of Islamic law), Shinkafi and Ali (2017) found that many scholars have tried to develop and measure the performance of IBs through the *maqāṣid al-Sharīʿah* framework (Mohammed *et al.*, 2015; Mohammed and Taib, 2016). Mohammed and Taib (2016) proposed the objectives of IBs based on the theory of *maqāṣid al-Sharīʿah* and derived a model of IBs performance measures based on these objectives. Hudaefi and Noordin (2019) developed an indicator to measure the performance of IBs that is known as a *maqāṣid al-Sharīʿah*-based performance yardstick. Tarique *et al.* (2021) also developed and subsequently validated a *maqāṣid al-Sharīʿah*-based performance evaluation model for IBs.

Nonetheless, very few studies documented in the literature have proposed the use of zakat as a performance indicator. Ibrahim *et al.* (2004) suggested some alternative reporting and performance measures that should be used by IBs. They used zakat to replace the COPER indicator, which is represented by earnings per share, and calculated the zakat ratio as "zakat amount to total equity." Recently, Mohammed and Muhammed (2017), Nurkhin *et al.* (2018); Nomran and Haron (2019), Alhammadi *et al.* (2020); Haron *et al.* (2021a); and Haron *et al.* (2021b) also used zakat ratios as an ISPER indicator in empirical studies besides some other COPER indicators. To calculate the zakat ratio, Mohammed and Muhammed (2017), Nomran and Haron (2019); Alhammadi *et al.* (2020); and Haron *et al.* (2021b) divided the zakat amount by total equity; Nurkhin *et al.* (2018) divided it by total assets, whereas Haron *et al.* (2021a) divided it by both total equity and total assets. However, no attempts have been made to introduce several zakat ratios as a performance indicator and to investigate their validity as an ISPER measurement. Therefore, the paper aims to fill this gap in the literature.

Data and methodology

Data and sample size

The authors used data from IBs' annual reports and the Data Stream/Bank Scope database for IBs located in Southeast Asia and Gulf Cooperation Council (GCC) regions, which is where most IBs are located (Grassa, 2013; Grassa and Matoussi, 2014). The base sample is an unbalanced panel of 284 Islamic bank-year observations from 45 IBs operating in Southeast Asia and the GCC countries for the period 2007–2015. Out of this number, however, this study uses an unbalanced panel of 214 Islamic bank-year observations from 37 IBs operating in Southeast Asia (Indonesia and Malaysia) and the GCC region (Bahrain, Saudi Arabia and the United Arab Emirates) after dealing with the data and deleting the outliers as shown in Table 1.

Measures of indicators

To measure the ISPER, four proxies are used, namely, zakat on assets (ZOA), zakat on equity (ZOE), zakat on returns (ZOR) and zakat on the funds of investment account holders (IAHs)/*muḍārabah*) (profit sharing) (ZOIAH). The first indicator, ZOA, is measured as "zakat amount to total assets," following Ibrahim *et al.* (2004), Nurkhin *et al.* (2018); and Haron *et al.* (2021a). When the total assets value reaches the *nisāb*, the obligation of an IB to pay zakat is triggered (Adnan and Abu Bakar, 2009). To calculate the zakat effect on the performance of IBs, Bukair and Abdul Rahman (2015) used the ratio of total amount of zakat over total assets. As discussed earlier, zakat can be used as a profitability measurement like in the case of tax ratios and then calculated as "zakat amount to total assets."

The ZOE indicator divides the "zakat amount on total equity" as used by Ibrahim *et al.* (2004), Mohammed and Muhammed (2017); Nomran and Haron (2019), Alhammadi *et al.* (2020); Haron *et al.* (2021a); and Haron *et al.* (2021b). The third indicator, ZOR, is calculated by dividing "zakat amount by net income." According to Mohammed and Muhammed (2017), "Zakat is an amount usually deducted from a bank's annual net profit, and this ratio is proposed by Islamic banking literature as an alternative ratio to measure ISPER based on its ability to reflect profitability" (p. 218). Basically, as income increases, the zakat payment increases (Sarif and Kamri, 2012).

Finally, the ZOIAH indicator is developed and introduced in this study as a new zakat ratio. Both the shareholders and IAHs are responsible for zakat payment on the funds in these accounts (Abdullah *et al.*, 2013), and these two financing sources almost formalize the IBs' investment portfolio (Archer and Karim, 2007; Farook *et al.*, 2011). Although IAH funds are neither a financial liability nor an equity instrument (Safieddine, 2009), they are similar to equity shares (Archer and Karim, 2007). According to Atmeh and Ramadan (2012), many studies conclude that the equity of investment accounts have to be classified as a special class of equity as the IBs invest deposits and share the profit with the holders while banks do not repay the depositors if they are at loss. In this study, therefore, investment accounts are considered a category of equity, following the literature. As the ZOE indicator divides the zakat amount by total equity, ZOIAH divides the zakat amount by *muḍārabah* investment account funds (a special class of equity).

It seems important to mention that this special class of equity (investment accounts) represents almost 42% of total assets, on average, for IBs in many countries as found by Grassa *et al.* (2019) and Saidani *et al.* (2020). Based on the argument of Farook and Lanis (2007) and Farook *et al.* (2011), Islamic investors prefer to invest their money as IAHs instead of as shareholders for two reasons. First, such investors are primarily interested in the IBs' services instead of sharing bank ownership. The second reason is the accessibility of investment accounts as compared to the shares of IBs (Farook and Lanis, 2007; Farook *et al.*, 2011).

However, the authors believe that calculating the ZOIAH ratio might enable us to capture the zakat impact based on another important part of the investment portfolio of IBs, which is IAHs funds besides shareholders' equity. The two ratios can then reflect the zakat impact

Country	No. of Islamic banks	No. of Islamic bank-year observations
Indonesia	9	43
Malaysia	16	93
Bahrain	6	27
Saudi Arabia	4	31
United Arab Emirates	2	20
Total	37	214

Source: Authors' own

Table 1.
Sample distribution

over the investment portfolio as a whole. The ZOE reflects the ratio of zakat amount over equity as discussed above while the ZOIAH would reflect the ratio of zakat amount over *muḍārabah* investment account funds.

In contrast, COPER is measured by four proxies, namely, return on assets (ROA), return on equity (ROE), operational efficiency in terms of assets (ROIAA) and operational efficiency in terms of equity (ROIAE) following previous studies (Grassa and Matoussi, 2014; Mollah and Zaman, 2015; Nomran and Haron, 2020b; Nomran and Haron, 2021). Table 2 presents the measurements of the indicators used in this study.

Methodologies applied

There is a remarkable trend to adopt structural equation modelling (SEM) in analysing panel data studies. Some studies use SEM to analyse panel data for a three-year period (Hu *et al.*, 2010; Azim, 2012; Ghofar and Islam, 2015), whereas some use it for a five-year period (Makki *et al.*, 2013). Other studies used SEM for a longer period such as an eight-year period (Ramachandran *et al.*, 2018), ten-year period (Goel *et al.*, 2015), 13-year period (Eling and Marek, 2014), 15-year period (Chang *et al.*, 2009) and 20-year period (Ramli and Nartea, 2016). This is because of the advantages of using SEM as it allows the inclusion of unobserved influence in the model through latent/unobservable variables which can be measured using many observed variables. SEM also checks the validity of the observed variables in measuring the constructs (Gefen *et al.*, 2000).

SEM analysis can be used by conducting two main steps. The first one is the measurement model, which shows whether the observable indicators of the constructs are valid, while the second step is the structural model that represents the proposed relationships among the variables based on the research framework (Ghofar and Islam, 2015).

The measurement model examines the validity of constructs through some tests, namely, the single-factor congeneric (SFC) and confirmatory factor analysis (CFA) (Rahim *et al.*, 2015; Ghofar and Islam, 2015). This measurement model can be divided into two different models, reflective and formative. In the formative model, the trend of arrows flows from the observable indicators to the latent construct, whereas the opposite applies in the reflective model (Gefen *et al.*, 2000). Selecting the appropriate measurement model, either reflective or formative, is an important step (Ghofar and Islam, 2015). One of the advantages of the reflective model is the ability to remove any indicator without affecting the latent variable while the opposite is true for the formative model as deleting any indicator means deleting a

Variables	Definitions and coding	Measurement
Islamic performance (ISPER)		
ZOA	Zakat on assets	Zakat amount divided by total assets
ZOE	Zakat on equity	Zakat amount divided by total equity
ZOR	Zakat on returns	Zakat amount divided by net income
ZOIAH	Zakat on IAHs funds	Zakat amount divided by total IAHs funds
Conventional performance (COPER)		
ROA	Return on assets	Net income divided by total assets
ROE	Return on equity (net asset)	Net income divided by total equity
ROIAA	Operational efficiency in terms of assets	Operating profit divided by total assets
ROIAE	Operational efficiency in terms of equity	Operating profit divided by total equity

Source: Authors' own

Table 2.
Measurement of variables

part of the construct (Bollen and Lennox, 1991). The formative model nevertheless suffers from the lack of internal validity and consistency (Ghofar and Islam, 2015). Following the studies of Ghofar and Islam (2015), Rahim *et al.* (2015); Mohd Sofian and Muhamad (2020); and Shamsudheen and Chowdhury (2020), which used the reflective model, this study uses the reflective measurement model in measuring the study constructs.

The measurement model tests will be used through the SFC and CFA methods to test the validity/reliability of the ISPER and COPER constructs using the AMOS 23.0 software. ISPER and COPER are considered as two latent variables (constructs), which can be measured by observable indicators. ISPER is measured by four observable indicators: ZOA, ZOE, ZOR and ZOIAH, whereas COPER is measured by four other indicators: ROA, ROE, ROIAA and ROIAE. The SFC model enables us to examine the validity of each construct separately, whereas the CFA method provides a validity test for the two constructs together, which will in turn confirm the findings.

However, it is important to mention that for each method, the SFC and the CFA, two main steps are used, which are the proposed model (model fit) test and the validity test. The following section provides a brief explanation of these steps.

Single-factor congeneric model

A SFC is a simple model, which focuses on the unidimensionality of a single construct (Ghofar and Islam, 2015). Unidimensionality indicates that there is no correlated error assumption, meaning that each latent variable can be designed to explain a set of indicators (Hair *et al.*, 2010).

However, to determine a model's quality and then check whether a single construct is valid or not, two steps should be used. The first step is to check whether a model fits the data well or not, and this test is conducted based on some fit indices that will be explained later. The second step is to check the validity test of the convergent validity/reliability. This test emphasizes that items of a construct should have a high proportion of variance in common (Hair *et al.*, 2010). As Fornell and Larcher (1981) suggested, three tests can be used to evaluate convergent validity: item reliability (IR), construct reliability (CR) and the average variance extracted (AVE).

The assessment of IR is conducted based on its factor loading onto the underlying construct. An item is considered to be significant when its factor loading is greater than 0.50 (Hair *et al.*, 2006). However, Hair *et al.* (2010) indicated that loading estimates of more than 0.3–0.4 are also acceptable, and Ghofar and Islam (2015) considered the loading weight of less than 0.3 to be very low. CR measures the composite reliability by capturing the degree to which a set of indicators reflect the common latent construct, and it is considered to be superior to Cronbach's alpha (Holmes *et al.*, 2006). A value of 0.7 is a common threshold that reflects high reliability. The value from 0.6 to 0.7 also suggests a good reliability (Hair *et al.*, 2010). The last indicator, AVE, is a more conservative test of convergent validity (Fornell and Larcher, 1981); its higher value means that the indicators represent the construct well. To have an acceptable convergent validity, the AVE value should be equal to or more than 0.50 (Hair *et al.*, 2010). However, the values of CR and AVE cannot be provided by AMOS; therefore, they should be calculated as in Table 7.

Confirmatory factor analysis

CFA or the measurement model assesses to what extent the indicators measure the concept (Hair *et al.*, 2010). To check whether constructs are valid or not, two steps should be used. The first is to check whether a model fits the data well or not, and the second step is to check the validity test. Similar to the SFC model, some fit indices show whether a measurement model is valid or not (Hair *et al.*, 2010). However, in CFA, the validity is called discriminant validity as it evaluates the extent to which constructs are different (Teo *et al.*, 2008). In CFA, to have acceptable discriminant validity, the AVE for two constructs have to be greater than the square of the correlation between both constructs (Fornell and Larcher, 1981). In this study, the CFA is employed on the two constructs, namely, ISPER and COPER. Hence, the AVE for ISPER and COPER is supposed to be greater than the square of the correlations between them to have adequate discriminant validity.

Empirical findings

Descriptive results

Table 3 depicts the results of descriptive statistics. The table shows that the mean of ISPER indicators (ZOA, ZOE, ZOR and ZOIAH) are 0.0006, 0.0046, 0.0765 and 0.0046, respectively, whereas the mean of the COPER indicators (ROA, ROE, ROIAA and ROIAE) are 0.8710, 9.6810, 1.2300 and 12.7430, respectively. Based on this, the highest mean for ISPER indicators is the mean of ZOR (0.0765) and the lowest mean is for ZOA (0.0006). In contrast, the highest mean for COPER indicators is for ROIAE (12.7430) and the lowest mean is for ROA (0.8710).

Analysis

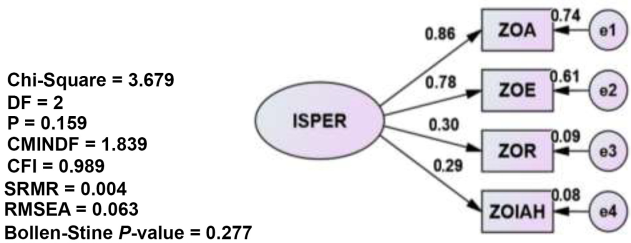
Validating the Islamic performance and conventional performance measurements models using single-factor congeneric

As there are two constructs, ISPER and COPER, and each one has multiple measures, the SFC model test is conducted for each construct separately. To examine whether ZOA, ZOE, ZOR and ZOIAH are valid indicators to measure ISPER, this study uses the SFC (Model 1) as depicted in Figure 1.

	ISPER				COPER			
Indicators	ZOA	ZOE	ZOR	ZOIAH	ROA	ROE	ROIAA	ROIAE
Mean	0.0006	0.0046	0.0765	0.0046	0.8710	9.6810	1.2300	12.7430
Std. dev.	0.0009	0.0049	0.2841	0.0095	1.3210	7.6570	1.1460	11.7510
Minimum	0.0001	0.0001	−0.3670	0.0001	−6.8400	−17.280	−2.190	−36.560
Maximum	0.0048	0.0216	3.0450	0.0650	4.5600	25.7700	4.6800	41.0400
N	214	214	214	214	214	214	214	214

Notes: *N* = Number of observations; Number of IBs = 37
Source: Authors' own

Table 3. Descriptive statistics of the indicators



Source: Authors' own

Figure 1. SFC model of ISPER – Model 1

Figure 1 shows that the SFC (Model 1) fits the data very well, based on the significant chi-square fit, $\chi^2(5) = 3.679$, p-value = 0.159. The model fits the data when the chi-square p-value is not significant (>0.05) (Holmes *et al.*, 2006). However, the distribution of multivariate data is not normal, as the critical value of the Mardia's coefficient for multivariate kurtosis equals 92.604, which is more than 2.58 (Table 4). As Ghofar and Islam (2015) state, the assessment of normality should be conducted to determine whether the existence of non-normal data would inflate the value of chi-square. The Bollen-Stine bootstrap is a suitable method to deal with non-normal data, and its p-value is an indicator of goodness of fit (Bollen and Stine, 1992). According to Ghofar and Islam (2015), "If the Bollen-Stine p-value is less than 0.05 ($p < 0.05$), the model will be rejected" (p. 62). The common number of bootstrap samples is between 250 and 2000, as mentioned by Bollen and Stine (1992). Using 1,000 bootstrap samples, following the study of Ghofar and Islam (2015), it is found that the p-value of Bollen-Stine is 0.277, which is not significant as Figure 1 presents. Hence, the SFC (Model 1) fits the data very well, and this is also approved by many other fit measure indices [normed chi-squire (CMINDF), comparative fit index (CFI), goodness-of-fit (GFI), adjusted goodness-of-fit (AGFI), Tucker-Lewis index (TLI), root mean-square error of approximation (RMSEA) and standardised root mean square residual (SRMR)] as their values are 1.839, 0.989, 0.992, 0.959, 0.968, 0.063 and 0.004, respectively, based on Table 4. As the SFC (Model 1) fits the data very well, there is no need for more tests to re-specify the model.

The second step, as explained above, is to conduct the convergent validity tests, namely, IR, CR and the AVE. The IR of each item is evaluated by the factor loading. As shown in Figure 1 and Table 5, the factor loadings of the items (ZOA, ZOE, ZOR and ZOIAH) are 0.86, 0.78, 0.30 and 0.29, respectively. It is noted that only ZOA and ZOE items have factor loadings of more than 0.50 as per the threshold set by Hair *et al.* (2006), whereas the ZOR and ZOIAH items have factor loadings of less than 0.30 which is very low as indicated by Ghofar and Islam (2015).

Table 6 shows the variance of indicators. According to Ghofar and Islam (2015), the variance of an indicator is useful to measure whether it has a high residual or error, which would influence the reliability of a construct. From Table 6, the standardized error

Table 4. Goodness-of-fit indices and Mardia's values

Indices	SFC Model 1	SFC Model 2a	SFC Model 2b	CFA Model 1	CFA Model 2	CFA Model 3
CMINDF	1.839	21.221	1.250	6.830	1.837	1.740
CFI	0.989	0.857	0.973	0.792	0.989	0.992
GFI	0.992	0.925	0.974	0.873	0.983	0.987
AGFI	0.959	0.627	0.966	0.759	0.941	0.950
TLI	0.968	0.572	0.975	0.694	0.972	0.980
RMSEA	0.063	0.308	0.043	0.165	0.063	0.059
SRMR	0.004	1.078	0.041	0.930	0.872	0.055
Comment	Fit	Not fit	Fit	Not fit	Not fit	Fit
Mardia's coeff.	92.604	19.491	19.491	63.448	15.673	7.185

Notes: CMINDF: Normed chi-squire; CFI: Comparative fit index; GFI: Goodness-of-fit; AGFI: Adjusted goodness-of-fit; TLI: Tucker-Lewis index; RMSEA: Root-mean-square error of approximation; SRMR: Standardised root mean square residual. The acceptable values for these indices are: CMINDF: between 1 and 3; CFI, GFI, AGFI, TLI: > 0.90; RMSE, SRMR: < 0.08 (Holmes *et al.*, 2006); Mardia's coeff.: Mardia's coefficient for multivariate kurtosis
Source: Authors' own

Indicators	Model 1	SFC Model 2a	Model 2b	Model 1	CFA Model 2	Model 3
ZOA ← ISPER	0.863	–	–	0.925	0.909	0.895
ZOE ← ISPER	0.781	–	–	0.733	0.742	0.753
ZOR ← ISPER	0.303	–	–	0.262	–	–
ZOIAH ← ISPER	0.285	–	–	0.283	–	–
ROA ← COPER	–	0.729	0.819	0.770	0.853	0.872
ROE ← COPER	–	0.778	0.730	0.756	0.697	0.688
ROIAA ← COPER	–	0.750	0.718	0.752	0.701	0.721
ROIAE ← COPER	–	0.523	0.247	0.478	0.236	–

Source: Authors' own

Table 5. Standardized regression weights

Indicators	Model 1	SFC Model 2a	Model 2b	Model 1	CFA Model 2	Model 3
ZOA	0.732	–	–	0.415	0.500	0.569
ZOE	0.000	–	–	0.000	0.000	0.000
ZOR	0.073	–	–	0.075	–	–
ZOIAH	0.000	–	–	0.000	–	–
ROA	–	0.789	0.561	0.686	0.460	0.404
ROE	–	0.726	0.848	0.787	0.943	0.967
ROIAA	–	1.870	2.087	1.858	2.172	0.417
ROIAE	–	99.855	78.621	106.094	126.778	–

Source: Authors' own

Table 6. Variance estimate values

estimates for the indicators ZOA, ZOE, ZOR and ZOIAH are 0.732, 0.000, 0.073 and 0.000, respectively.

For all the models, the calculated values of CR and AVE are shown in Table 7. From Table 7, the CR value for SFC (Model 1) is 0.86, which is greater than the threshold value of 0.7 (Hair *et al.*, 2010). Table 7 also shows that the AVE value is 0.38, which is less than the threshold value of 0.5 (Hair *et al.*, 2010). Based on the convergent validity tests, the SFC (Model 1) is not valid. This is because of the factor loadings of ZOR and ZOIAH being below 0.30. To improve the model validity, it is better to delete these two indicators. However, reinvestigating the validity of the ISPER construct after deleting the ZOR and ZOIAH will be conducted using the CFA model later as the SFC model cannot be used if the items of a construct are less than three (Ghofar and Islam, 2015).

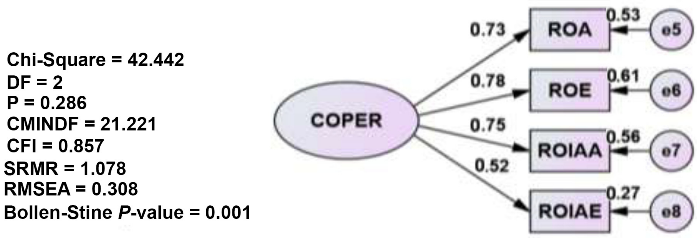
To examine whether ROA, ROE, ROIAA and ROIAE are valid indicators to measure the COPER construct, this study uses the SFC (Model 2a) as Figure 2 shows.

From Figure 2, the SFC (Model 2a) does not fit the data as the *p*-values of both tests, chi-square and Bollen-Stine, are significant (0.000 and 0.001, respectively). As Table 4 shows, the distribution of multivariate data is not normal, as the critical value of the Mardia's coefficient is 19.491, which is more than 2.58. By using the Bollen-Stine bootstrap based on 1,000 bootstrap samples, it is found that its *p*-value is significant (0.001). Other indices also confirmed that the model does not fit the data, based on Table 4, with the exception of GFI value (0.925), which is greater than the threshold 0.90 (Holmes *et al.*, 2006). Table 4 depicts

Table 7.
Construct reliability and average variance extracted

Model		CR Value	CR Comment	AVE Value	AVE Comment
SFC	Model 1	0.86	Valid	0.38	Not valid
SFC	Model 2a	0.07	Not valid	0.49	Not valid
SFC	Model 2b	0.07	Not valid	0.44	Not valid
CFA-ISPER	Model 1	0.90	Valid	0.38	Valid
CFA-COPER		0.06	Not valid	0.48	
CFA-ISPER	Model 2	0.84	Valid	0.69	Valid
CFA-COPER		0.05	Not valid	0.44	
CFA-ISPER	Model 3	0.83	Valid	0.68	Valid
CFA-COPER		0.74	Valid	0.58	

Notes: Construct reliability (CR) is calculated by dividing the (square of total items loadings) by the sum of (square of total items loadings and total error variance of items) of the underlying construct (Ghofar and Islam, 2015); CR $\geq$ 0.7 is the threshold; CR between (0.6 and 0.7) is also acceptable (Hair *et al.*, 2010); AVE is calculated by dividing the sum of (each item loading squared) by number of items of the underlying construct (Teo *et al.*, 2008); AVE $\geq$ 0.5 is the threshold (Hair *et al.*, 2010); AVE for the CFA model 1 is valid as the AVE of sub-constructs are (0.38 and 0.48); hence, the average is 0.43, which exceeds the square of the correlation between sub-constructs (0.16); AVE for the CFA model 2 is valid as the AVE of sub-constructs are (0.69 and 0.44); hence, the average is 0.57, which exceeds the square of the correlation between sub-constructs (0.24); AVE for the CFA model 3 is valid as the AVE of sub-constructs are (0.68 and 0.58); hence, the average is 0.63, which exceeds the square of the correlation between sub-constructs (0.24)
Source: Authors' own



Source: Authors' own

Figure 2.
SFC model of COPER – Model 2a

that the value-of-fit measure (CMINDF) is 21.221, which does not fall within the acceptable range (1–3) as set by Holmes *et al.* (2006). Similarly, the value-of-fit measure indices (CFI, AGFI and TLI) are 0.857, 0.627 and 0.572, respectively, which are less than the threshold value of 0.90 as suggested by Holmes *et al.* (2006). Also, the values of RMSEA and SRMR are 0.308 and 1.078, respectively, while they should be less than 0.08 according to Holmes *et al.* (2006), confirming a poor goodness of fit for the model. Therefore, there is a need for more tests to re-specify the model. However, the validity tests also confirm that the SFC (Model 2a) is not valid. Although the factor loading values of the four items are more than 0.50 as in Figure 2 and Table 5, the CR and AVE values are 0.07 and 0.49, which are less than the threshold of both values (0.7 and 0.5, respectively) as set by Hair *et al.* (2010) based on Table 7.

In such cases, to improve the goodness of fit, the availability of error correlation between the indicators can be checked using the modification index values (Hair *et al.*, 2010; Ghofar and Islam, 2015). However, correlation among items in a single construct is acceptable

(Holmes *et al.*, 2006). High modification index may reflect that the two indicators share something in common, which is not observed in the model (Ghofar and Islam, 2015).

As presented in Table 8, the ROA and ROIAE indicators are correlated with the largest modification index value (26.110), meaning that this significant correlation may reduce the chi-square by as much as 26.110. Another possible correlation is noticed between ROE and ROIAA with the value of the modification index, 6.930, while the third error correlation is between ROE and ROIAE with the value of the modification index being 6.880. The last error correlation is between ROIAA and ROIAE with the value of the modification index being 4.391.

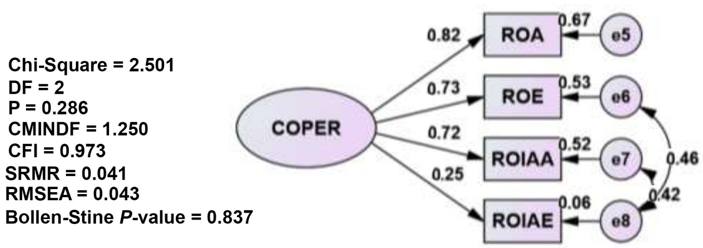
However, the correlation between the variance of ROA and ROIAE and that of ROE and ROIAA cannot be conducted. According to Ghofar and Islam (2015), the correlated errors between variance should be considered when its values are positive and have a theoretical justification. Hence, only the second and first error correlations (ROE and ROIAE, ROIAA and ROIAE) will be taken into account as their values of co-varying error variance are positive and can be justified theoretically as well. The ROE may have a correlation with the ROIAE as they are divided by the same value; the denominator in both is the total equity, and hence, both ratios may decrease when the total equity increases. On the other hand, the ROIAA and ROIAE indicators use operating profit as the numerator value, therefore, both ratios may increase when the operating profit increases.

After correlating the mentioned indicators (ROE and ROIAE, ROIAA and ROIAE), more analysis was conducted as presented in Figure 3, the SFC (Model 2b). From Figure 3, there is an increase in the fit of the SFC (Model 2b) compared to SFC (Model 2a) as shown in Figure 2. Based on Figure 3, the p-value of chi-square is 0.286 while the p-value of Bollen-Stine is 0.837, which are both greater than 0.05, reflecting very good goodness of fit. Other fit indices also confirm that the SFC (Model 2b) is fit as Table 4 depicts. The fit measure indices (CMINDF, CFI, GFI, AGFI, TLI, RMSEA and SRMR) values are 1.250, 0.973, 0.974, 0.966, 0.975, 0.043 and 0.041, respectively. Furthermore, Figure 3 shows that there is no multi-collinearity issue in the

Indicators	M.I.	Par change
ROIAA ↔ ROIAE	4.391	2.309
ROE ↔ ROIAE	6.880	1.852
ROE ↔ ROIAA	6.930	−0.269
ROA ↔ ROIAE	26.110	−3.596

Source: Authors' own

Table 8. Modification index for the SFC (Model 2a)



Source: Authors' own

Figure 3. SFC model of COPER – Model 2 b

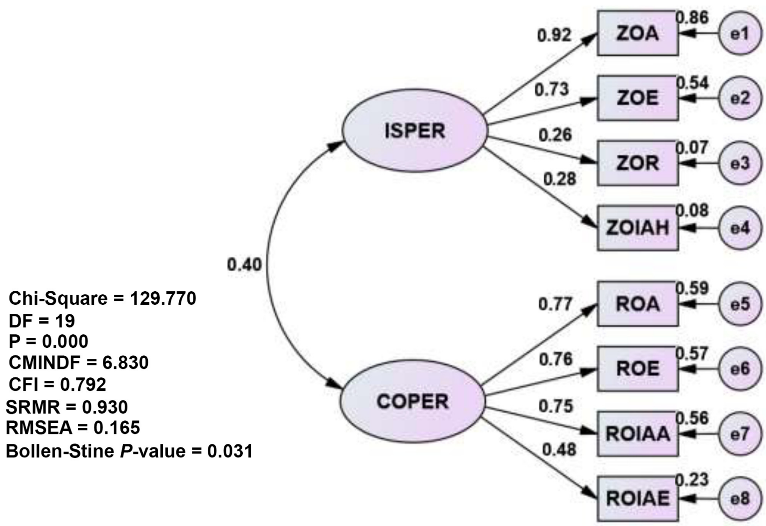
SFC (Model 2b) as the item correlation values are 0.46 and 0.42. Ghofar and Islam (2015) asserted that this issue can arise if there are any correlations greater than 0.8.

Given that the SFC (Model 2b) fits the data very well, the second step is to use the convergent validity tests, the IR, CR and AVE. Based on Figure 3 and Table 5, the factor loadings of the items ROA, ROE, ROIAA and ROIAE are 0.82, 0.73, 0.72 and 0.25, respectively. The ROA, ROE and ROIAA items have factor loadings of more than 0.50 while only the ROIAE item has a factor loading of less than 0.50, which is very low. In addition, from Table 6, the ROIAE has a high standardized error estimate (78.62) while the other indicators (ROA, ROE and ROIAA) have low estimates of 0.56, 0.84 and 2.08, respectively. This means that the ROIAE indicator suffers from high residual/error, which may affect the reliability of the latent variable (COPER) based on the argument of Ghofar and Islam (2015). Regarding the CR and AVE, Table 7 presents that the CR and AVE values for the SFC (Model 2b) are 0.07 and 0.44, which are less than the thresholds of 0.7 (CR) and 0.5 (AVE) as set by Hair *et al.* (2010). Hence, the conclusion is that although the SFC (Model 2b) fits the data it is still not valid based on the convergent validity tests of the IR, CR and AVE. The reason may be because the indicator ROIAE has a factor loading of less than 0.30 and a high standardized error of 78.62. Based on this, deleting the ROIAE indicator would improve the model validity as it will be seen in the CFA model.

Validating the multi-bank performance measurement model using confirmatory factor analysis

The CFA is conducted on the two constructs, namely, ISPER and COPER. However, an important step before deleting the indicators that have poor factor loadings from the ISPER and COPER constructs is to conduct the test using all the indicators as used in the SFC (Models 1, 2a and 2b). This would help in confirming the findings of the SFC models.

In the CFA (Model 1) as presented in Figure 4, the ZOA, ZOE, ZOR and ZOIAH indicators are used to measure ISPER, whereas the ROA, ROE, ROIAA and ROIAE are used



Source: Authors' own

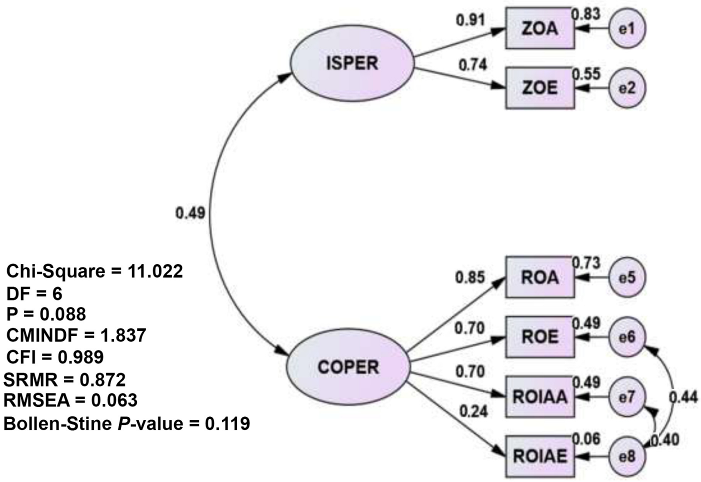
Figure 4.
CFA model of multi-bank performance (ISPER and COPER) – Model 1

to measure COPER. From Figure 4, the CFA (Model 1) does not fit the data as the *p*-values of both tests, chi-square and Bollen-Stine are significant (0.000 and 0.031, respectively).

Table 4 shows that the distribution of multivariate data is not normal, as the critical value of the Mardia's coefficient is 63.448, which is more than 2.58 (CFA – Model 1). To deal with this issue, the Bollen-Stine bootstrap is used using 1,000 bootstrap samples; it is found that the *p*-value of Bollen-Stine is 0.031, which is less than 0.05. Thus, the CFA (Model 1) does not fit the data, and the other fit measure indices also confirmed that based on Table 4. The values of fit measure indices (CMINDF, CFI, GFI, AGFI, TLI, RMSEA and SRMR) are 6.830, 0.792, 0.873, 0.759, 0.694, 0.165 and 0.930, respectively. As the CFA (Model 1) does not fit the data, more tests should be conducted to re-specify the model.

The validity tests also confirm that the CFA (Model 1) is not valid. Figure 4 and Table 5 show that the factor loadings of the ISPER indicators (ZOA, ZOE, ZOR and ZOIAH) are 0.92, 0.73, 0.26 and 0.28, respectively, and those of the COPER items (ROA, ROE, ROIAA and ROIAE) are 0.77, 0.76, 0.75 and 0.48, respectively. This confirms the findings of SFC (Model 1 and Model 2b) regarding the IR test in which ISPER items (ZOR and ZOIAH) and COPER item (ROIAE) have a poor factor loading of less than 0.50. Besides this, although the CR value for the CFA (Model 1), ISPER, is valid, being 0.90, the same value for the COPER is 0.06, which is not valid (Table 7). The AVE value of the ISPER and COPER (CFA Model 1) are 0.38 and 0.48, respectively, of which the average AVE for the two constructs is 0.43. Based on Figure 4, the correlation of the pair (ISPER and COPER) is 0.40, and the square of the correlation between both constructs is 0.16. Thus, the average AVE (0.43) is greater than the square of the correlation (0.16), meaning that both constructs are different and discriminant validity is upheld. However, the CFA (Model 1) is still not fit and is not valid in spite of the fact that the average AVE test is upheld. The potential reason is related to the poor factor loadings, which can be deleted, and thus increasing the model's goodness of fit.

Therefore, in the following model, CFA (Model 2) as Figure 5 shows, the poor items of the ISPER construct (ZOR and ZOIAH) will be deleted while the COPER items will be included together in the model but after correlating indicators (ROE and ROIAE, ROIAA and ROIAE)



Source: Authors' own

Figure 5.
CFA model of multi-bank performance (ISPER and COPER) – Model 2

as mentioned in the SFC (Model 2b). This is to confirm whether the CFA (Model 2) can fit the data after correlating these indicators.

From Figure 5, it can be said that the CFA (Model 2) goodness of fit is increased as the p-values of both tests, chi-square and Bollen-Stine, exceed the 0.05 value (0.088 and 0.119), respectively. This improvement is asserted by the other fit indices with the exception of the SRMR value, which is 0.872 as shown in Table 4. Hence, the CFA (Model 2) still does not fit the data (Table 4). The validity tests also indicate that the CFA (Model 2) is still not valid. As Figure 5 and Table 5 show and based on the IR test, all the factor loading values of ISPER and COPER constructs items are greater than 0.5 with the exception of the ROIAE item with the value of 0.24. Furthermore, Table 6 presents that the ROIAE indicator has a very high standardized error estimate (126.778). Regarding the CR and AVE tests as shown in Table 7, although the CR value for ISPER (which is 0.84) is valid, the same value for COPER is 0.05 which is not valid. The AVE value of ISPER and COPER of CFA (Model 2) are 0.69 and 0.44, of which the average AVE of both constructs is 0.57; hence, this average is greater than the square of the correlation between the two constructs (0.24). Although the average AVE is valid, the other tests – the IR and CR – are still not valid. Thus, the ROIAE item that has a poor factor loading will be deleted, and then the goodness of fit and validity of the model will be improved. This can be seen from the CFA Model 3, as Figure 6 shows.

It can be seen from Figure 6 that the revised model CFA (Model 3) fits the data very well, as the p-values of chi-square and Bollen-Stine equal 0.138 and 0.175, respectively. The other fit measure indices confirm this improvement, as Table 4 presents. The fit measure indices (CMINDF, CFI, GFI, AGFI, TLI, RMSEA and SRMR) values are (1.740, 0.992, 0.987, 0.950, 0.980, 0.059 and 0.055), respectively. The validity tests also confirm that the CFA (Model 3) is valid. Figure 6 and Table 5 show that IR test is valid as all the factor loading values of both constructs items, the ISPER and COPER, are greater than 0.5. CR values for the CFA (Model 3) are also valid as their values exceed the threshold of 0.7 which are 0.83 and 0.74 for ISPER and COPER, respectively (Table 7). Finally, the AVE values of the ISPER and COPER of CFA (Model 3) are 0.68 and 0.58, of which the average AVE of both constructs is 0.63. As the average is 0.63, exceeding the square of the correlation between both constructs (0.24), the model is valid. Hence, it can be concluded that the ISPER and COPER constructs are two distinct constructs, as discriminant validity is upheld in the CFA (Model 3).

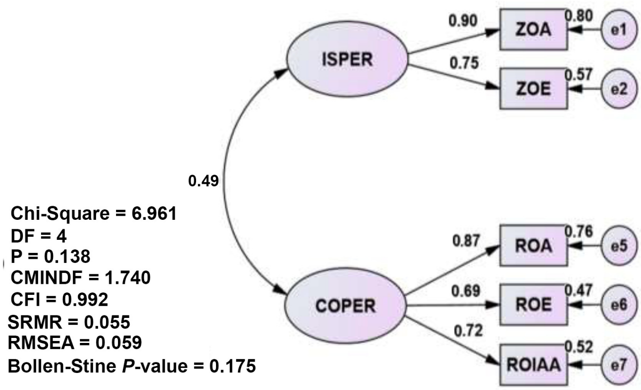


Figure 6.
CFA model of multi-bank performance (ISPER and COPER) – Model 3

Source: Authors' own

Table 9 provides a summary for the conducted tests, goodness of fit and validity, for the SFC and CFA models.

Table 9 shows that most the SFC models are fit but not valid. This is because of the items with poor factor loadings. However, reinvestigating the validity of the SFC model after deleting the poor items has not been conducted as such investigation cannot be used if the items of a construct are less than three (Ghofar and Islam, 2015). This is why the findings of SFC have been confirmed using the CFA model.

Table 9 also shows that the initial CFA models (Model 1 and 2) failed to be fit and valid because of the items that have poor factor loadings. After deleting the items that have poor factor loadings, it is found that the revised model CFA (Model 3) fits the data and is valid. Some studies that use CFA, however, failed to find the initial model to be fit and valid before removing the items that have poor factor loadings such as the study of Djafri *et al.* (2018).

In this study, it is found that the discriminant validity of multi-bank performance, as measured by ISPER (ZOA and ZOE) and COPER (ROA, ROE and ROIAA), is very high based on the model goodness-of-fit indices and discriminant validity tests (IR, CR and AVE). This is to say that the ZOA and ZOE indicators are valid to measure ISPER, whereas the ZOR and ZOIAH indicators are not valid. In contrast, the ROA, ROE and ROIAA are valid to measure COPER, but the ROIAE is not valid.

Conclusion and implications

IBs differ from their conventional counterparts as they have different operating mechanisms for their activities that mainly rely on Sharīʿah principles. Accordingly, the performance of IBs should be measured by using a Sharīʿah approach; therefore, it has been suggested that zakat is the suitable measurement to measure the performance of IBs within the constraints of achieving IBs' goals and the Islamic economics goals as a whole. Zakat can reflect the profitability status as the more the IBs generate profit, the more zakat they have to pay. Furthermore, as the total assets value of IBs reaches the *nisāb*, their obligation to pay zakat increases.

Having a measurement indicator of ISPER is very important for ethical reasons. From this angle, IBs need to have indicators which can reflect their adherence to the Sharīʿah rules in particular and their achievement of Islamic economics goals in general. This indicator should measure the IBs' performance within the guidelines based on Sharīʿah principles. In

		Validity tests			
Model	Model fit	IR	CR	AVE	Decision
SFC – Model 1	Fit	Very low	Valid	Not valid	Fit but not valid
SFC – Model 2a	Not fit	Very good	Not valid	Not valid	Not fit and not valid
SFC – Model 2b	Fit	Very low	Not valid	Not valid	Fit but not valid
CFA – Model 1	Not fit	Very low	Not valid	Valid	Not fit and not valid
CFA – Model 2	Not fit	Very low	Not valid	Valid	Not fit and not valid
CFA – Model 3	Fit	Very good	Valid	Valid	Fit and valid

Notes: Item reliability (IR) is "very good" if all the items loading weights exceed 0.5 as the cut-off figure (Hair *et al.*, 2010); IR is "acceptable" if there is at least an item which has loading weight of more than 0.3–0.4; IR is "very low: if there is at least an item which has loading weight of less than 0.3 (Ghofar and Islam, 2015). Decision is taken based on all conducted tests, goodness of fit and validity
Source: Authors' own

Table 9. Summary of fit indices and validity tests

addition, providing such a measurement indicator of ISPER is very important for marketing reasons. It would help in meeting the expectations of IBs' stakeholders, especially those with religious concerns, thus enhancing customers' trust of IBs.

However, there is a shortage of studies that have tried to develop and validate the measurement construct of ISPER in the Islamic banking field. Therefore, this paper aims to empirically examine to what extent zakat ratios are valid to be used as measurement indicators of ISPER. By using SFC and CFA methods, all the SFC and CFA models conducted in this study failed to be fit and valid with the exception of the last CFA model (Model 3), which is fit and valid. In this model, it is found that the discriminant validity of ISPER and COPER constructs is very high. The findings of this study confirm that the ZOA and ZOE indicators are valid to measure ISPER, whereas ZOR and ZOIAH indicators are not valid. In contrast, the ROA, ROE and ROIAA are valid to measure COPER but not the ROIAE.

There are some important implications of these findings for many related parties. The contribution of this paper lies in the new knowledge to the existing body of literature whereby the performance of IBs should be measured using an Islamic profitability measure besides the usual conventional profitability measurements. The implications of these findings for IBs are that they should give due importance to zakat ratios, particularly ZOA and ZOE, as indicators for measuring and evaluating their performance according to the Sharīʿah. It is strongly recommended that IBs calculate and disclose these ratios in their annual reports. This would help meet the expectations of IBs' stakeholders, especially with regard to the aspect of Sharīʿah principles. Based on this, marketers of IBs should focus on ISPER measurement as an important element to attract new Muslim customers and enhance current customers' trust of IBs. As such, there are some implications of these findings for the regulatory authorities across countries, especially Islamic countries. The regulatory authorities should impose on IBs calculation and disclosure of zakat ratios to ensure evaluation of IBs from the aspect of the Sharīʿah. For researchers, they should use these ratios to measure the ISPER either together with the COPER or separately.

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