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Article

Investigating equity-based financing and debt-based financing in Islamic banks in Indonesia

ISRA international journal of islamic finance

Provided in Cooperation with:

International Shari'ah Research Academy for Islamic Finance, Kuala Lumpur

Reference: Mukhibad, Hasan/Setiawan, Doddy (2023). Investigating equity-based financing and debt-based financing in Islamic banks in Indonesia. In: ISRA international journal of islamic finance 15 (4), S. 87 - 103.

<https://journal.inceif.edu.my/index.php/ijif/article/download/689/452/1664>.

doi:10.55188/ijif.v15i4.689.

This Version is available at:

<http://hdl.handle.net/11159/703284>

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INVESTIGATING EQUITY-BASED FINANCING AND DEBT-BASED FINANCING IN ISLAMIC BANKS IN INDONESIA

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Received

17 February 2021

Revised

7 March 2021

19 July 2021

15 December 2023

16 December 2023

20 December 2023

Accepted

20 December 2023

ABSTRACT

Purpose — This study empirically examines whether equity-based financing (EBF) generates fixed income similar to debt-based financing (DBF) in the context of Islamic banks in Indonesia. It also investigates whether the Islamic bank financing return rate (IBFRR) has a relationship with the conventional bank lending interest rate (CBLIR).

Design/Methodology/Approach — This paper uses monthly data for the period 2009–2019 and produces 132 units of analysis. The object of the study is Islamic banks (IBs) and conventional banks (CBs) in Indonesia. The study uses the Vector Error Correction Model (VECM) as the tool of analysis.

Findings — This study provides evidence that, contrary to DBF products, EBF does not have fixed income. EBF in Indonesian IBs has been executed according to the requirements of Islamic law. The study also finds that CBLIR is not correlated with IBFRR.

Originality/Value — This is the first study to correlate equity-based financing return rate (EBFRR) with debt-based financing return rate (DBFRR). This paper also examines the no-causality relationship between CBLIR and IBFRR.

Research Limitations — This study uses Islamic banking data in the aggregate. Therefore, it cannot explain whether research results differ between banks.

Practical Implications — EBF in Indonesian IBs has been applied according to its epistemology. However, the significant increase in *mushārah* financing noted over the study period should be followed by a careful customer business feasibility analysis.

Keywords — Conventional bank lending interest rate (CBLIR); Debt-based financing (DBF); Debt-based financing return rate (DBFRR); Equity-based financing (EBF); Equity-based financing return rate (EBFRR); Fixed income; Interest rate; Islamic bank financing return rate (IBFRR); Non-performing loan (NPL)

Article Classification — Research paper



ISRA International
Journal of Islamic
Finance (IJIF)

Vol. 15 • No. 4 • 2023 pp.
87-103

eISSN:
2289-4365

DOI:
doi.org/10.55188/ijif.v15i4.689

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INTRODUCTION

Islamic law forbids interest as it is considered unjust, a condition that requires penance and undermines brotherhood. It is also contrary to the values of Islamic spirituality. Therefore, Islamic banks (IBs) have been established to fulfil the demand for interest-free banking services (Šeho *et al.*, 2020).

IBs promote profit-and-loss sharing (PLS) transactions that can be implemented on savings and deposit products, known as Investment Account Holders funds (IAHs), and through financing products such as *muḍārabah* and *mushāarakah* financing, hereinafter called equity-based financing (EBF) (AlShattarat & Atmeh, 2016). Under savings and deposit accounts, structured using PLS modes, the bank will share its revenue with customers depending on the revenue earned. Similarly, when banks apply PLS in financing products, the customers' business performance will influence the profit-sharing paid by customers to the bank. In other words, there is no guarantee that the bank will obtain a fixed income (Warninda *et al.*, 2019). Banks can also receive losses if the businesses run by the customers incur losses. With these characteristics, equity-based financing (EBF) is considered to be in harmony with the principles of Islamic law (Abdul-Rahman *et al.*, 2014). These are also the main differentiators between IBs and conventional banks (CBs) (Chong & Liu, 2009; Salman & Nawaz, 2018).

Past literature highlighted that the global Islamic banking industry has EBF ratios which are less dominant than debt-based financing (DBF) ratios (Mills & Presley, 1999; Siddiqui, 2008; Anisykurlillah *et al.*, 2018; Warninda *et al.*, 2019; Miah & Suzuki, 2020). Data on the EBF ratio of the global Islamic banking industry are depicted in **Table 1**. Low EBF ratios also occur in the Indonesian Islamic banking industry, as indicated in **Table 2**.

Table 1: EBF

Region	<i>Muḍārabah</i> (%)	<i>Mushāarakah</i> (%)	Total (%)
Middle East	3.35	2.94	6.29
South Asia	0.58	34.88	35.46
Southeast Asia	3.51	11.23	14.74

Source: Warninda *et al.* (2019)

Table 2: EBF in Indonesia

Financing	2006	2007	2008	2009	2010	2011	2012	2013	2014	2014	2015	2016	2017	2018	2019	Mean
EBF ratio (%)	31.29	35.73	35.65	36.28	34.11	28.43	26.91	29.06	31.98	32.23	35.76	38.04	42.68	45.62	48.22	35.46
DBF ratio (%)	68.71	64.27	64.35	63.72	65.89	71.57	73.09	70.94	68.02	67.77	64.24	61.96	57.32	54.38	51.78	64.54
Increase in EBF ratio (Δ)	27.37	56.08	36.38	24.91	36.72	25.52	35.97	34.79	19.14	1.23	18.58	23.83	26.33	22.45	16.85	27.08
Increase in DBF ratio (Δ)	37.59	27.85	36.85	21.56	50.37	63.53	46.76	21.15	3.80	0.05	1.34	12.26	4.17	8.68	5.25	22.75

Source: Islamic Banking Statistics (2019)

Table 2 shows that the Indonesian Islamic banking industry had an average EBF ratio of 35.46 per cent during the observation years. Therefore, the DBF ratio of 64.54 per cent is greater than the EBF ratio. Although this is the case, EBF has had a greater average growth (27.08 per cent) than DBF (22.75 per cent), as seen from rows 3 and 4 in **Table 2**. This may indicate that the

weaknesses that exist under EBF—such as asymmetric information resulting in adverse selection problems and moral hazards—are diminishing (Azmat *et al.*, 2015). It may also show that the sharing of risk among banks and entrepreneurs in EBF contracts is reducing. It is suspected that the certainty about the acquisition of return on EBF is similar to that on DBF. This proposition is built based on the study by Hidayah *et al.* (2019), which states that IBs attempted to translate PLS transactions according to local market preferences by trying to provide a steady income and transfer risk from the banks to the entrepreneurs. This finding leads to the suspicion that PLS practices are not in line with PLS ontology and may thus result in non-interest-free practices (Ergeç & Arslan, 2013; Mahmood & Rahman, 2017).

This study evaluates the implementation of EBF in Indonesia and examines whether EBF generates income similar to DBF and whether the equivalent rate of Islamic bank financing return rate (IBFRR) and conventional bank lending interest rate (CBLIR) are correlated. Previous studies have tested more on the correlation of interest rate with Islamic banks' return rate. However, previous studies, such as those conducted by Chong and Liu (2009), Yusof *et al.* (2015), Hamza (2016) and Yuksel (2017), are limited to investment account holders (IAH) products. We found Khalidin and Masbar (2017) and Šeho *et al.* (2020) to be the only studies investigating whether IBFRR is interest-free. This study extends the studies of Khalidin and Masbar (2017) and Šeho *et al.* (2020) by comparing IBFRR with the interest rate and comparing the equity-based financing return rate (EBFRR) and the debt-based financing return rate (DBFRR). Additionally, this study also examines the relationship between the return from EBFRR and CBLIR, as it has been debated by researchers such as Mahmood and Rahman (2017) and Korkut and Özgür (2017).

This paper first focuses on whether EBF, like DBF, has a fixed return. Second, it examines whether CBLIR influences the EBFRR. The results are presented by describing the EBFRR, DBFRR, IBFRR and CBLIR. Next, a causality test is conducted between the EBFRR and DBFRR. This study also examines the causality from the IBFRR to CBLIR.

THEORETICAL REVIEW AND HYPOTHESIS DEVELOPMENT

Financing at Islamic Banks

IBs act as intermediaries between customers with excess money and those who need money. Unlike CBs, IBs will collect money from third parties using a profit-sharing contract (savings and deposits) or *wadī'ah* (demand deposits). Funds raised by banks are distributed among different modes of financing, such as *muḍārabah*, *mushārah*, *murābahah*, *salam*, *istiṣnā'* and *ijārah* financing.

Muḍārabah and *mushārah* financing uses the EBF modes. Under *muḍārabah* transactions, banks provide capital to customers (entrepreneurs/debtors). Further, the financial losses of the customers are fully borne by banks. However, the customer is responsible if he incurs a loss following any transgression or negligence (Warninda *et al.*, 2019). If both the bank and the customer contribute capital in a business, the transaction is known as *mushārah*, and the business loss is divided between the two parties based on the share of capital ownership.

In contrast with *muḍārabah* and *mushārah*, financing transactions under *murābahah*, *salam*, *istiṣnā'* and *ijārah* do not transfer the risk of loss from the customer to the bank. *Murābahah*, *salam* and *istiṣnā'* transactions are sale and purchase transactions. Moreover, banks

as sellers are entitled to receive income on the difference between the selling price and the purchase price. *Ijārah* transactions are leases of assets. As the owner of the assets, the bank is therefore entitled to receive rental income from this transaction. Therefore, under *murābahah*, *salam* and *istiṣnā'* transactions, banks are entitled to receive fixed incomes and there is no risk transfer for business losses faced by customers (Alam & Parinduri, 2017; Suzuki *et al.*, 2019; Warninda *et al.*, 2019).

As such, EBF transactions are riskier than other transactions. Abusharbeh (2014) and Mukhibad and Khafid (2018) found a relationship between EBF and non-performing financing (NPF). Mukhibad *et al.* (2023), using data from 54 banks from 19 countries, found that EBF has a positive effect on NPF. Belkhaoui *et al.* (2020) report that a higher level of participation in *muḍārabah* and *mushārah* financing will generate high credit risk for banks in the Gulf Cooperation Council (GCC). One of the risks of EBF arises when the borrower does not allow the bank to track the earned income so that the bank cannot ensure a fair process for revenue sharing (Sapuan *et al.*, 2016; Warninda *et al.*, 2019). Previous studies have identified problems arising under PLS, such as agency problems (Dar & Presley, 2000), information asymmetry (Muda & Ismail, 2010; Warninda *et al.*, 2019), moral hazard (Mahmood & Rahman, 2017), and high monitoring costs (Abdul-Rahman *et al.*, 2014; Hidayah *et al.*, 2019).

Implementation of PLS Transactions

The rapid development of IBs has encouraged researchers to evaluate whether their approach is interest-free. Researchers have examined whether the practice of PLS products is in line with the fundamental concept of interest-free banking under Islamic law. PLS aligns with the basic principle of Islamic finance, which states that there is no income without risk-bearing (Mahmood & Rahman, 2017). Interest is deemed an unfair transaction because the profits are realised without sharing risk (Rosly & Bakar, 2003; Belal *et al.*, 2015). The argument reflects the Islamic legal principle that loss is commensurate with return and earning is commensurate with liability (Šeho *et al.*, 2020).

Researchers investigating the implementation of PLS transactions in IBs have produced mixed findings. Chong and Liu (2009) found that EBF implementation was deficient and that IBs' deposits were not interest-free. IBs are more inclined to use DBF, which is another acceptable mode of financing in Islamic law, and ignore other modes of financing for avoiding interest (Chong & Liu, 2009). This finding is strengthened by the research of Hamza (2016) and Šeho *et al.* (2020). Hamza (2016) found that the ratio of capital and interest rates are two factors that positively affect the return on deposits of IBs. Interest rates determine the returns on deposits of IBs. Šeho *et al.* (2020) found that the equity-based financing return rate (EBFRR) is positively correlated with interest rates. Additionally, sales-based contracts and leases continue to dominate IBs' financing (Šeho *et al.*, 2020).

Different findings are presented by Yusof *et al.* (2015) and Yuksel (2017). Yusof *et al.* (2015) found no relationship that prevails between PLS rates and interest rates in the long run. In the short term, the study found that there is a relationship between PLS equivalent rates and CBs' interest rates, except in the case of IBs located in Saudi Arabia. Yuksel (2017) found that PLS transactions of IBs are not related to CBs. This finding indicates that determination of the PLS

equivalent rate in IBs does not use interest rate benchmarks. Similarly, determination of the interest rate also does not use PLS return benchmarks.

Hidayah *et al.* (2019) carried out a different research approach to explore the application of PLS in IBs, notably using a qualitative approach. The study by Hidayah *et al.* (2019) involved 40 participants consisting of managers, advisors, Shari'ah compliance officers, Shari'ah board members and regulators from Oman, Abu Dhabi, the United Kingdom (UK), Malaysia and Indonesia. They found that the products structured using PLS were repackaged to replicate conventional finance products. The offering of PLS products was aimed at meeting the spiritual needs of customers who sought to comply with Shari'ah requirements. Nonetheless, the practice of PLS faced constraints such as market competition, which forced IBs to harmonise the interests of various stakeholders to be able to compete. One participant even revealed a bank's attempt to make a fixed return on EBF and further transfer the risk of loss from the bank to the entrepreneur (Alaabad & Masih, 2016; Hidayah *et al.*, 2019).

Hypothesis Development

Previous studies have produced mixed findings in presenting evidence of PLS transactions in IBs, leading to debates among researchers (Mahmood & Rahman, 2017). First, there are indications that it is difficult to practise EBF according to its epistemology (i.e., sharing of profit and loss between partners). The actual practice of EBF transactions is found to differ from its ideal application and instead be the result of the bank trying to replicate conventional financial products so that EBF generates fixed income and transfers risks from the bank to customers. Warninda *et al.* (2019) also show that EBF transactions pose a problem of uncertain return as the distribution of return is based on the realisation of the customer's business profit. Thus, the structuring of EBF similar to DBF results in fixed income and in the transfer of risk similar to the case of DBF (Alaabad & Masih, 2016; Warninda *et al.*, 2019).

EBF products that tend to generate fixed incomes are structured as *mushārah mutanāqishah* (diminishing partnership) (Kashi & Mohamad, 2017). The *mushārah mutanāqishah* contract is a *mushārah* agreement combined with buying and selling (Fatwa DSN-MUI/XI/2008). A *mushārah mutanāqishah* contract can also be a hybrid contract that combines three concepts: *mushārah*, *ijārah* (lease) and *wa'd thumma bay'* (promise followed by a sale) (Ahroum *et al.*, 2020). The lease contract used under *mushārah mutanāqishah* generates the fixed rental fee, which is shared between the customer and the bank based on their respective share of ownership in the underlying asset.

Kashi and Mohamad (2017) state that the *mushārah mutanāqishah* contract is controversial due to the question regarding whether it includes a partnership transaction or is more likely to resemble conventional loans. Kashi and Mohamad (2017) found that *mushārah mutanāqishah* financing is more inclined towards debt contracts than partnerships. According to Hosen (2009), the application of the *mushārah mutanāqishah* scheme is beneficial to banks just as much as, or more than, *murābahah* financing. Based on the above discussion, therefore, it can be said that there is an a priori link between EBF and DBF, and thus the following hypothesis is formulated:

H1: There is a causality between the equity-based financing return rate (EBFRR) and the debt-based financing return rate (DBFRR).

The other factor that distinguishes EBF from DBF is credit risk. Abusharbeh (2014) and Mukhibad and Khafid (2018), using a sample of IBs in Indonesia, found a positive relationship between the EBF ratio and non-performing financing (NPF), where an increase in EBF causes an increase in NPF. IBs in Indonesia prefer to use DBF to better control bank risks (Abusharbeh, 2014). Grassa (2012), using a sample of IBs in the GCC countries, concluded that greater revenue sharing leads to higher levels of risk for IBs. Thus, IBs with high EBF tend to have higher credit risks (Khan & Ahmed, 2001; Ariffin *et al.*, 2009; Mismam *et al.*, 2020). In addition, the high credit risk in EBF may be due to agency problems (Dar & Presley, 2000; Beck *et al.*, 2013); information asymmetry (Muda & Ismail, 2010; Warninda *et al.*, 2019); and moral hazard (Mahmood & Rahman, 2017).

On the contrary, other literature argues that EBF can reduce credit risk (Chong & Liu, 2009; Zeineb & Mensi, 2014; Warninda *et al.*, 2019). EBF requires IBs to perform stricter due diligence and supervision of their financing. To avoid moral hazard and adverse selection issues, IBs would evaluate entrepreneurs' eligibility strictly so that credit risk can be reduced (Warninda *et al.*, 2019).

In accordance with the purpose of this study to empirically examine whether EBF is similar to DBF, the following hypothesis is proposed:

H2: There is a causality between the equity-based financing risk (EBFRISK) and debt-based financing risk (DBFRISK).

The findings of previous studies have shown that EBF has not been practised according to its rules. They also concluded that EBF is not free from interest. Ideally, profit-sharing in EBF contracts should be based on real performance rather than interest. However, the tests carried out by Chong and Liu (2009), Hamza (2016) and Šeho *et al.* (2020) show that the EBFRR is related to CBLIR.

Additionally, Yusof *et al.* (2015) and Yuksel (2017) found no relationship between the IBFRR and CBLIR. Yusof *et al.* (2015) even rejected the conclusion that IBs are not interest-free simply because of the finding that the deposit return rate (IAH return rate) is correlated with the interest rate. According to Yusof *et al.* (2015), the profit shared by a bank with the IAHs is derived from EBFRR, where EBFRR is influenced by the opportunity cost of capital or the real rate of economic growth. This is one of the main determinants of interest rates in the economy. Yusof *et al.* (2015) stated that the return on investment of IBs in the form of EBF is assumed to be influenced by economic conditions. Further, these economic conditions are indicators for the determination interest rates. This assumption is reinforced by Zarrouk *et al.* (2016), who found that IBs perform better in an environment where gross domestic product (GDP) and investments are high. Based on this analogy, it is clear that the EBFRR can be related to CBLIR. Therefore, the next hypotheses proposed in this study are:

H3: There is a causality between the equity-based financing return rate (EBFRR) and the conventional bank lending interest rate (CBLIR).

H4: There is a causality between the Islamic bank financing return rate (IBFRR) and the conventional bank lending interest rate (CBLIR).

RESEARCH MODEL

This study empirically examines causality between certain variables using time series data. The causality variables are:

1. Equity-based financing return rate (EBFRR) and debt-based financing return rate (DBFRR)
2. Equity-based financing risk (EBFRISK) and debt-based financing risk (DBFRISK)
3. Equity-based financing return rate (EBFRR) and conventional bank lending interest rate (CBLIR)
4. Islamic bank financing return rate (IBFRR) and conventional bank lending interest rate (CBLIR).

It uses IBs and CBs in Indonesia and monthly data observations from 2005 to 2019, producing 132 units of analysis. The study uses the Islamic banking statistics and Indonesia banking statistics issued by the Financial Services Authority (OJK) as the data source.

The data in this study were time-series data and were processed using the Vector Error Correction Model (VECM), which can be written as follows:

$$\Delta EBFRR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta EBFRR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta DBFRR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (1)$$

$$\Delta DBFRR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta DBFRR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta EBFRR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (2)$$

$$\Delta EBFRR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta EBFRR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta DBFRISK_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (3)$$

$$\Delta DBFRISK_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta DBFRISK_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta EBFRR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (4)$$

$$\Delta EBFRR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta EBFRR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta CBLIR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (5)$$

$$\Delta CBLIR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta CBLIR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta EBFRR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (6)$$

$$\Delta IBFRR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta IBFRR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta CBLIR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (7)$$

$$\Delta CBLIR_t = a_1 \sum_{i=1}^k \beta_{1i} \Delta CBLIR_{t-i} + \sum_{i=1}^k \theta_{1i} \Delta IBFRR_{t-i} + \delta_1 \gamma_{t-1} + \varepsilon_1 \quad (8)$$

Where:

- EBFRR is equity-based financing return rate
- DBFRR is debt-based financing return rate
- IBFRR is Islamic bank financing return rate (EBFRR and DBFRR)
- EBFRISK is equity-based financing risk that is measured by non-performance financing (NPF)
- DBFRISK is debt-based financing risk that is measured by non-performance loans (NPLs)
- CBLIR is conventional bank lending interest rate
- Δ is the first-difference operator
- k_i is various lag on the regressors
- γ_{t-1} is the error correction term

The first step in the VECM test is the stationarity test (Haron & Azmi, 2008). The VECM model requires that all variables have stationary data. This study used the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests as the stationary test. The next step is the VAR order selection procedure. This step selects the optimal lag based on Akaike Information Criteria

(AIC), which is commonly used to select the optimal lag in VAR models. This test produces the optimal lag in the second order. After determining the optimum lag, a VAR stability test is conducted using the autoregressive root (AR) table. If the value of the modulus is less than 1, it would indicate that the VAR satisfies the stability condition.

The next step is the cointegration test. The cointegration test was used based on maximum eigenvalue and trace statistics. This study will reject H_0 if the probability value is less than 0.05 and vice versa. The cointegration vector represents the long-run equilibrium. Granger causality test (GCT) is used to examine the causality and direction of the influence of one variable on another variable. This study uses bivariate GCT based on Granger (1969). The Impulse Response Function (IRF) is the response to a single impulse input, measured over a time series.

RESULTS

This section presents the descriptive data in **Table 3**. Observations made were based on monthly data for 11 years. **Table 3** shows that *muḍārabah* financing has a return with an average equivalent rate of 14.17 per cent, while the equivalent rate of *mushārah* financing return is 11.81 per cent. The equivalent return rates of *murābahah*, *istiṣnā'* and *ijārah* financing are 13.76 per cent, 13.15 per cent and 5.51 per cent, respectively. The average EBFRR is 12.99 per cent, while the average DBFRR is 10.81 per cent. The standard deviation of EBFRR is 2.09 and that of DBFRR is 1.15. This standard deviation of EBFRR, which is greater than that of the DBFRR, leads to the hypothesis and the finding that EBF has greater income volatility than DBF. Strengthened by **Figure 1**, the results show that the EBF practice is in line with its epistemology.

Table 3: Descriptive Statistics

Indicators	Mean	St Dev.	Min.	Median	Max	Skew	Kurt.
EBFRR (<i>Muḍārabah</i>)	14.17	3.10	9.17	13.53	21.87	0.26	-0.72
EBFRR (<i>Mushārah</i>)	11.81	1.55	8.91	11.57	14.97	0.005	-0.82
DBFRR (<i>Murābahah</i>)	13.76	1.44	11.44	13.61	18.69	0.51	0.52
DBFRR (<i>Istiṣnā'</i>)	13.15	1.17	10.56	13.26	14.73	-0.75	-0.50
DBFRR (<i>Ijārah</i>)	5.51	4.98	-0.005	8.73	11.16	-0.04	-1.99
EBFRR	12.99	2.09	9.205	12.97	17.68	-0.21	-0.96
DBFRR	10.81	1.15	7.63	10.82	12.71	-0.13	-0.95
EBFRISK- <i>Muḍārabah</i>	2.99	1.10	1.52	2.66	6.55	1.71	2.85
EBFRISK- <i>Mushārah</i>	4.49	1.09	2.94	4.49	6.84	0.34	-1.00
DBFRISK- <i>Murābahah</i>	4.38	0.72	2.90	4.51	6.09	-0.41	-0.34
DBFRISK- <i>Istiṣnā'</i>	2.56	1.34	1.19	1.88	6.27	1.23	0.33
DBFRISK- <i>Ijārah</i>	2.76	1.67	1.43	2.18	7.57	2.15	2.85
EBFRISK	4.19	0.88	2.89	4.20	6.18	0.49	-0.65
DBFRISK	4.24	0.70	2.83	4.40	5.88	-0.38	-0.41
CBLIR	12.39	0.98	10.58	12.46	14.84	0.07	0.02
IBFRR (EBFRR and DBFRR)	11.63	7.26	14.09	0.83	11.81	-2.06	6.90

Source: Authors' own

Test Model

This study uses time-series data and assumes that the underlying time series is stationary (Gujarati & Porter, 2009). Stationary data is data that does not vary due to seasonal patterns. Two-unit root tests are utilised in this study, namely the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests, which are usually used for time series data. The results of the ADF and PP tests are presented in **Table 4**. With the ADF and PP tests at the level, the probability is more

than 0.05, which indicates that the data is not stationary at the level. The ADF and PP tests results on the first difference produce a probability of less than 0.05, which indicates that the data is stationary at the first difference.

Table 4: Unit Root Test Results

Variables	ADF Test				Phillip Perron Test			
	Level		First Difference		Level		First Difference	
	t-statistic	Prob.	t-statistic	Prob.	t-statistic	Prob.	t-statistic	Prob.
EBFRR	-0.4791	0.8905	-12.7528	0.0000 ***	-0.9771	0.7601	-25.5422	0.0000 ***
DBFRR	-1.2969	0.6298	-16.8003	0.0000 ***	-1.4268	0.5673	-17.1043	0.0000 ***
EBFRISK	-2.11199	0.2408	-5.53099	0.0000 ***	-1.4886	0.5331	-8.5463	0.0000 ***
DBFRISK	-1.12638	0.7005	-9.79921	0.0000 ***	-0.9716	0.7585	-9.8293	0.0000 ***
IBFRR	-1.64317	0.4577	-11.9363	0.0000 ***	-2.8519	0.0540	-21.0779	0.0000 ***
CBLIR	-1.73734	0.4102	-9.28375	0.0000 ***	-1.7454	0.4061	-10.5601	0.0000 ***

Note: ***, **, * indicate significance at 1%, 5%, 10%, respectively.

Source: Authors' own

Table 5 shows the results of the VAR stability test using the AR Root table. If the VAR estimation result is unstable, then the Impulse Response Function and Variance Decomposition will be invalid. **Table 5** shows the value of modulus less than 1 and indicates that VAR satisfies the stability condition.

Table 5: VAR Stability Test

Root	Modulus
-0.379873 - 0.510677i	0.636470
-0.379873 + 0.510677i	0.636470
-0.000775 - 0.491089i	0.491089
-0.000775 + 0.491089i	0.491089
0.090515 - 0.411987i	0.421813
0.090515 + 0.411987i	0.421813
-0.089001	0.089001
-0.027045	0.027045

Source: Authors' own

Cointegration Test

Table 6 shows the cointegration test using the maximum eigenvalue and trace statistics. The cointegration test results show a probability value of less than 0.05 and thus, the decision is to reject the null hypothesis and shows that there is cointegration between the variables tested. In other words, there are 6 cointegration vectors for a set of variables in the system. The existence of a cointegration vector indicates that all variables in the system have long-run equilibrium.

Table 6: Cointegration Test

Hypothesised No. of cointegrating equations CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob.**
None *	0.540490	139.5766	95.75366	0.0000
At most 1 *	0.408151	91.36577	69.81889	0.0004
At most 2 *	0.296348	58.84650	47.85613	0.0033
At most 3 *	0.247858	37.05525	29.79707	0.0061
At most 4 *	0.191932	19.39579	15.49471	0.0123
At most 5 *	0.094915	6.183060	3.841466	0.0129

Source: Authors' own

Granger Causality Test

The Granger causality test (GCT) is used to test the causality and direction of the influence of one variable on another variable. The GCT is used to answer the research hypotheses as presented in **Table 7**. The GCT on whether there is correlation between the EBFRR and DBFRR produced an f-statistic of 0.73015 and a probability of 0.4839. However, the correlation DBFRR to EBFRR produces an f-statistic of 1.06075 and a probability of 0.3493. These results indicate that there is no correlation between EBFRR and DBFRR and vice versa.

The GCT to test the causality of EBFRR to DBFRR produced an f-statistic of 1.11514 and a probability of 0.3347. However, the results of the DBFRR test against EBFRR resulted in an f-statistic of 0.14343 and a probability of 0.8667. This result also shows that there is no correlation between the NPF from EBF and DBF. This means that the risks of EBF and DBF are mutually unrelated.

The results of the GCT between the CBLIR with EBFRR produced an f-statistic of 0.08380 with a probability of 0.9197. Conversely, the results of the causality test between EBFRR and CBLIR produced an f-statistic of 0.03641 and a probability of 0.9643. These results indicate that EBFRR is not related to CBLIR. These results reinforce the conclusion that there is a tendency for EBF to be consistent with its epistemology.

Table 7 further shows that the GCT between IBFRR and CBLIR produced an f-statistic of 0.03764 with a probability of 0.9631. The GCT between CBLIR and IBFRR produced an f-statistic of 0.11441 with a probability of 0.8920. The test shows that IBFRR (including EBFRR and DBFRR) is not correlated with CBLIR and vice versa.

Table 7: Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
Hypothesis 1		
D(EBFRR) does not Granger Cause D(DBFRR)	0.73015	0.4839
D(DBFRR) does not Granger Cause D(EBFRR)	1.06075	0.3493
Hypothesis 2		
D(EBFRR) does not Granger Cause D(DBFRR)	1.11514	0.3347
D(DBFRR) does not Granger Cause D(EBFRR)	0.14343	0.8667
Hypothesis 3		
D(EBFRR) does not Granger Cause D(CBLIR)	0.03641	0.9643
D(CBLIR) does not Granger Cause D(EBFRR)	0.08380	0.9197
Hypothesis 4		
D(IBFRR) does not Granger Cause D(CBLIR)	0.03764	0.9631
D(CBLIR) does not Granger Cause D(IBFRR)	0.11441	0.8920

Source: Authors' own

Impulse Response Function

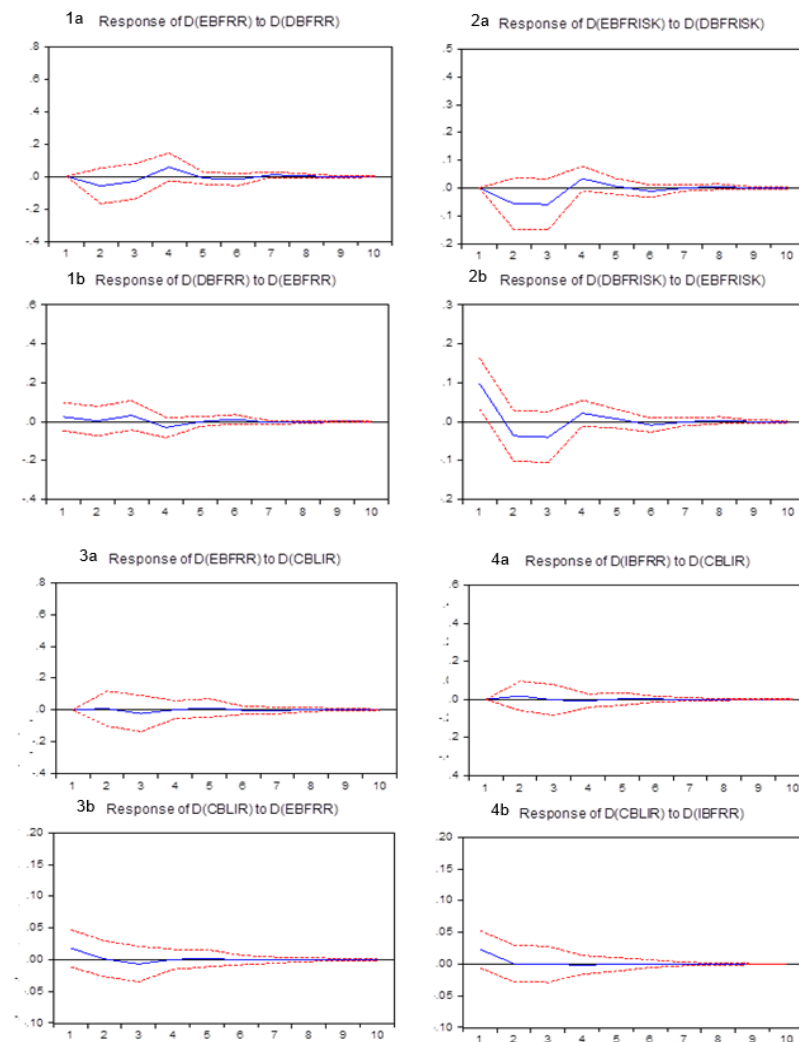
The impulse response function (IRF) describes the reaction of the variable as a function of time and parameterises the dynamic behaviour of the variable. This study uses eight variables, and the results of the IRF are presented in **Figure 1**. The response of EBFRR to DBFRR (1a) indicates that EBFRR fluctuates and has a positive or negative response. This response is for approximately six months. The same response is also shown in (1b), showing that DBFRR has a fluctuating response (negative and positive response) to EBFRR.

The response of EBFISK to DBNFRISK (2a) showed a fluctuating response for approximately six months and had more negative responses. The same response also occurs in DBFRISK to EBFISK. This fluctuating response confirms the GCT results that there is no correlation between DBFRISK and EBFISK.

The response of EBFRR to CBLIR (3a) showed less response. The negative response only occurred in the third month. On the other hand, the response of CBLIR to EBFRR (3b) was more volatile than the response of EBFRR to CBLIR. The response of CBLIR to EBFRR is for approximately four months. The response ‘interest lending’ has a high response to EBF returns. This fluctuating response confirmed the absence of a correlation between EBFRR and CBLIR.

The response of IBFRR to CBLIR (4a) showed a less fluctuating response. A positive response occurred in the second month. On the other hand, CBLIR has a fluctuating response to IBFRR (4b). **Figure 1** shows that CBLIR had a positive response to IBFRR in the second month.

Figure 1: Impulse Response Function Results



Source: Authors' own

DISCUSSION

IBs have two different types of financing in the process of sharing returns between banks and customers, notably, EBF and DBF. In EBF, the bank obtains income that comes from a certain percentage (or the ratio) of business revenue run by the customer. In DBF, banks receive income on sales profit margins or rental income of a fixed amount.

Other researchers identified that the high risk of EBF is due to the potential for uncertain income compared to DBF (Warninda *et al.*, 2019). The GCT results in **Table 7** show that EBF and DBF have different characteristics of revenue acquisition risk. EBF has greater income uncertainty (Warninda *et al.*, 2019). The EBFRR and DBFRR are not correlated. Additionally, in line with the findings of Ernawati (2016), it is found that EBF (especially *muḍārabah*) has a lower certainty of return than DBF. This means that the two financing modes are different and it can be concluded that both EBF and DBF are functioning in line with their epistemology. This result rejects the conclusion of Hidayah *et al.* (2019) on the pseudo practice of EBF, which seemingly operates similar to DBF. This study also rejects the argument of Mahmood and Rahman (2017) and the findings of Chong and Liu (2009), Ergeç and Arslan (2013), Hamza (2016) and Šeho *et al.* (2020), who claimed that PLS products offered by IBs are not interest-free. Hidayah *et al.* (2019) concluded that banks implemented PLS contracts artificially because the banks modified the PLS contract to make it easier to operate in line with customer preferences by setting fixed income policies, similar to the case of DBF. However, the results in this study show that EBF generates more volatile returns than DBF. This is in line with the main characteristics of PLS. This study's and Hidayah *et al.*'s (2019) results differ due to the differences in the two studies. Hidayah *et al.* (2019) used qualitative methods. Therefore, their conclusions were based on the results of interviews with bank managers. However, this study employed a quantitative approach and used empirical data reported in the financial statements. Further, there is a possibility that what was conveyed by the informants in Hidayah *et al.*'s (2019) study was not supported by data in the financial statements.

Table 3 shows that EBF has a lower risk than DBF. When viewed from the type of financing, *mushārah* financing was found to have a higher risk than *muḍārabah* financing. This finding rejected the results of Ernawati (2016), who stated that *muḍārabah* had a higher risk than *mushārah* due to information asymmetry. Also, this research differs from the findings of Belkhaoui *et al.* (2020) and Mukhibad *et al.* (2023), who reported that EBF has a positive influence on NPF. We found that *murābahah* financing has higher risk compared with other types of EBF, such as *muḍārabah*. This is contrary to the concept of *murābahah* financing. The difference between this research's results and previous literature is that this research processes aggregate data for all banks, whereas previous literature processed data for individual banks. The characteristics of EBF financing cause banks to be stricter in channelling their financing; banks analyse the feasibility and projected profits of businesses run by customers to determine the proportion of profit sharing between the bank and customers. However, in DBF, which generates fixed income for the bank, the customer eligibility analysis differs from that of EBF. Moreover, Hendrik *et al.* (2018) show that DBF financing is for consumer financing and contributes most significantly to the increase of NPF. This condition caused DBF to have a greater risk in aggregate than EBF. There is no information asymmetry as in *muḍārabah*. From these findings,

therefore, the conclusion that EBF has a higher risk than DBF is rejected. We suspect that the type of contract is not the cause of the difference in risks.

When viewed from the risk of financing, the results of the study show that the EBF RISK and DBF RISK are not correlated. The results indicate that DBF has a higher risk than EBF. We further assume that the low EBF RISK does not mean that EBF is not in line with its epistemology. This is because high risk is significantly influenced by the ability and character of the customer. We also found that the products that had the highest risk were *mushārahah*, *murābahah* and *muḍārahah*. The high risk of *mushārahah* and *murābahah* financing triggered a high bank risk. Therefore, EBF has a higher risk than DBF (Alam & Parinduri, 2017; Suzuki *et al.*, 2019; Warninda *et al.*, 2019). However, this high risk is due to uncertainty about return rather than a high NPL.

The finding showed that there is no causality between EBFRR and CBLIR. This finding reinforces the study's other finding that EBF conform with its epistemology. In contrast to CBLIR, the equivalent of EBF return rate cannot be determined by the bank at the time of the contract. Rather, the determination of EBFRR is based on the business results run by entrepreneurs.

Comparing the EBFRR and CBLIR shows that CBs receive an interest rate of 12.39 per cent, which is greater than IBFRR with an equivalent rate of 11.63 per cent. The low equivalent rate of Indonesian IB financing may be due to the low market share of the Indonesian IBs, which is only 5.3 per cent (Mukhibad *et al.*, 2020). A low market share allows companies to adopt strategies that can help reduce the selling price of products and consequently attract customer interest.

The results of the correlation test between IBFRR and CBLIR show that the study found no causality between the two. In other words, IBFRR is unrelated to CBLIR, and vice versa. This result reinforces the conclusion that IBs' financing policies are not based on interest rates. These results reject the findings of Šeho *et al.* (2020), who found a positive correlation between equity-based financing return rate (EBFRR) and interest rates. Additionally, the study supports the conclusion of Yusof *et al.* (2015) and Yuksel (2017) that IBs are free from the interest rate. Thus, IBs do not use CBLIR as a standard in determining the return rate on the financing they provide to customers.

CONCLUSION

This study contributes to the debate on whether IBs offer PLS transactions according to its epistemological rulings as per Islamic law. This study's results indicate that EBFRR is not related to DBFRR, leading to the conclusion that both EBF and DBF in Indonesian IBs operate in line with their Sharī'ah rules.

The results also provide evidence that the risk between EBF and DBF is mutually unrelated. This study further proves the main characteristics of EBF that have a different or higher risk than DBF. The study also identified the correlation between EBFRR and CBLIR and found that the two are not related. EBFRR has an uncertain nature and cannot be determined in advance by the bank at the time of the contract. EBFRR is different from CB's interest rate, where the bank can determine interest at the time of the credit agreement.

Moreover, the results prove that there is no correlation between IBFRR and CBLIR. The findings of this study and previous studies show that IBFRR is not related to interest rates. IBs do not use the interest rate as a standard in determining the return rate on the financing they provide to customers. IBFRR is based on the outcomes of businesses run by customers.

This study used time series data presented by banking regulators in Indonesia and not cross-sectional data. Therefore, it cannot explain whether EBF is implemented in line with its initial concept in all banks. Future research can make use of cross-sectional data to complement this study's results. Additionally, the equivalent return rate indicator reported by the regulators has been used. Future research can use another proxy by comparing the costs with the amount of financing reported in the banks' financial statements.

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DECLARATION

Credit Authorship Contribution Statement

- Hasan Mukhibad: Conceptualization, Investigation resources, Methodology, Data curation, Validation formal, Analysis, Writing, and Visualization.
- Doddy Setiawan: Conceptualization, Analysis, Review, and Editing.

Declaration of Competing Interest

The authors state that no known competing financial interests or personal relationships could have influenced the research work.

Acknowledgement

None

Data Availability

Data will be made available on request to the corresponding author.

Appendix

None