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PROFIT-AND-LOSS SHARING FINANCING, OPERATING EXPENSES, AND THE INTERMEDIATION COSTS OF ISLAMIC RURAL BANKS IN INDONESIA

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ABSTRACT

This paper examines the effect of profit-and-loss sharing financing (PLS financing) and operating expenses on the intermediation costs of Islamic rural banks in Indonesia. Using a panel dataset of 147 Islamic rural banks over the period 2011-2021 and dynamic panel regressions, it shows that, in general, PLS financing exerts no significant influence on the Islamic rural banks' intermediation costs, as measured by the net margin. Meanwhile, the operating expenses are significantly and positively affecting the banks' net margin, the result that is robust to different regression specifications. Accordingly, the initiatives to promote PLS financing will, at least, not necessarily have a detrimental effect on the net margin. Operating expenses matter more, underscoring the need for serious efforts to improve the effectiveness of Islamic local banks' cost management.

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I. INTRODUCTION

Islamic banks, as financial intermediaries, facilitate the flow of funds from surplus economic actors to those in need of funds. Unlike conventional banks, Islamic banks operate in accordance with Islamic principles (Al-Jarhi, 2007). The operation of Islamic banks involves three parties: surplus economic actors as ultimate financiers, banks as financial intermediaries, and those who require funds. When Islamic banks receive funds from surplus economic actors, they act like entrepreneurs and engage in profit-and-loss-sharing (PLS) contracts. Conversely, when intermediating the funds, Islamic banks act like financiers to their clients and may use different contracts, particularly PLS contracts, sales contracts, lease contracts, or a combination of these contracts. The revenue Islamic banks obtain from channelling funds is shared with the providers of funds based on a pre-agreed proportion (Habib, 2018; Iqbal & Mirakhor, 2011). It is from this arrangement that Islamic banks generate a net PLS margin, or net margin, which is the spread between the income earned from their financing activities and the expenses incurred.

Net margin, on the one hand, reflects banks' ability to generate financing income that exceeds their financing expenses, showcasing profitability (Bennaceur & Goaied, 2008; López-Penabad et al., 2022; Ozili & Arun, 2023). On the other hand, from a broader societal perspective, net margin represents the intermediation costs incurred by banks while performing their services as financial intermediaries (Afrin et al., 2022; Ibrahim & Law, 2019; Jarmuzek & Lybek, 2020; Poghosyan, 2013). Managing net margin in Islamic banking is crucial to allow for an efficient intermediation system and support economic growth.

There have been a number of studies examining net margin in Islamic banking. Some of these studies have attempted to identify the determinants of Islamic banks' net margin, such as Hutapea and Kasri (2010), Lee and Isa (2017), Malim et al. (2017), Malim and Normalini (2018), Bougatef and Korbi (2018) and Salleh et al. (2018). Some other studies have focused on specific determinants such as regulations (Khan et al., 2021), competition (Trinugroho et al., 2018), market power (Widarjono et al., 2023), income structure (Azad et al., 2023), and liquidity (Kesraoui et al., 2022) or compared the net margin in Islamic and conventional banking (Ibrahim & Law, 2019; Shawtari et al., 2019; Susamto et al., 2021).

Remarkably, despite the prominence of PLS financing in Islamic banking literature (Abdul-Rahman et al., 2017, 2018; Othman et al., 2023; Rahman, 2010), very few studies have included the potential effect of PLS contracts (i.e., PLS financing) on net margin (Widarjono et al., 2023). There is a view that that PLS financing in Islamic banking leads to higher costs (Kuran, 1996). In addition to uncertainty from deposit supplies and financing demand, Islamic banks face more uncertainty from unpredictable PLS income, inducing them to raise their net margin to compensate for the costs. However, there are also contentions that PLS financing can potentially reduce intermediation costs—as measured by net margin—in Islamic banking (Chapra, 1982; Siddiqi, 1983). PLS contracts may lead to a close and long-standing relationship between Islamic banks and their clients, fostering an environment of trust over time and reducing the need for a higher net margin.

The effect of operating expenses on net margin has also been overlooked. While operating expenses have been acknowledged as one of the determinants of net margin (Lee & Isa, 2017; Maudos & Fernández de Guevara, 2004; Maudos & Solís, 2009), there remains a lack of in-depth analysis of how this factor intricately intertwines with net margin in Islamic banking. As will be explained later, operating expenses may increase banks' vulnerability to uncertainty costs and decrease banks' flexibility and adaptability to different situations, necessitating a higher net margin.

This paper seeks to examine the effect of PLS financing and operating expenses on the net margin of Islamic rural banks in Indonesia. To achieve its objective, this paper carries out dynamic panel regressions for an unbalanced panel of *Bank Perekonomian Rakyat Syariah* (literally means Islamic People's Economy Banks, more often called Islamic Rural Banks or Islamic Local Banks, or Islamic BPRs).[1] Islamic BPRs are authorized to provide financial services within a designated province. Unlike commercial banks, Islamic BPRs are restricted to collecting savings and time deposits, offering financing, and placing funds with other banks or the central bank. Islamic BPRs are prohibited from accepting demand deposits, providing payment services, or engaging in foreign exchange activities. Although Islamic rural banks, such as Islamic BPRs, may not enjoy the same popularity as commercial banks and possess relatively smaller assets, they play a significant role as financial intermediaries within the country. The results indicate that the effect of PLS financing on the net margin of Islamic BPRs is mostly not significant. By contrast, the effect of operating expenses is significantly positive and robust to different regression models.

This paper contributes to the existing literature in several ways. First, this paper extends the current understanding of the determinants of net margin in Islamic banking (Bougatef & Korbi, 2018; Hutapea & Kasri, 2010; Lee & Isa, 2017; Malim et al., 2017; Salleh et al., 2018). The current paper is different in that it explicitly focuses on the potential effects of PLS financing and operating expenses. Second, this paper expands the empirical literature examining the role of PLS financing in Islamic banking. Previous research has highlighted the possible effect of PLS financing on Islamic banks' profitability (Mukhibad et al., 2023), liquidity (Abdul-Rahman et al., 2017, 2018), stability (Othman et al., 2023), and insolvency risk (Rahman, 2010). The current paper is different in that it links PLS financing to net margin. Third, this paper covers Islamic rural banks instead of commercial banks. The existing studies on net margin in Islamic banking, with the exception of Trinugroho et al. (2018), use commercial banks as their samples. By considering Islamic local banks, this paper fills a gap in the literature and provides a more comprehensive understanding of the nature of net margin in different types of banks in Islamic banking.

The remainder of this paper is organized as follows. Section two provides a brief literature review, emphasizing the theoretical basis of the effect of PLS financing and operating expenses on net margin. Section three describes the

1 Bank Perekonomian Rakyat was known as *Bank Perkreditan Rakyat* (conventional BPRs) or *Bank Pembiayaan Rakyat Syariah* (Islamic BPRs) until mid-January 2023, when the Law Number 4 Year 2023 was passed by the Indonesian House of Representatives (DPR) and became effective.

empirical strategy. Section four presents and discusses the empirical results. Section five offers concluding remarks.

II. LITERATURE REVIEW

Net margin in Islamic banking shares similarities with the concept of net interest margin in conventional banking. Therefore, the theoretical model in the net margin analysis can be referred to the dealership model pioneered by Ho and Saunders (1981). The model acknowledges the innate risk aversion of banks and the idea that banks inherently operate within an environment permeated by various uncertainty costs. As such, it is necessary for banks to maintain a positive net margin to compensate for their role in financial intermediation. Ho and Saunders' (1981) dealership model outlines this invariably positive margin as the "pure spread." Maudos and Fernández de Guevara (2004) and Maudos and Solís (2009) present extended interpretations of the model, asserting that the level of net margin is the result of a combination of determinants. These include pure spread determinants, bank-specific variables previously not identified as pure spread determinants, and other variables that reflect the prevailing macroeconomic conditions.

The adoption of Ho and Saunders' (1981) dealership model in the Islamic banking context is underpinned by several assumptions (Susamto et al., 2021). The first assumption is that Islamic banks, akin to their conventional counterparts, aspire to maximize the expected utility of their wealth. This is despite the emphasis placed on the principles of social solidarity within the realm of Islamic banking. The second assumption is that Islamic banks, much like conventional banks, are subject to uncertainty costs. Finally, Islamic banks, in a fashion similar to conventional banks, exhibit a risk-averse attitude, and hence require a net margin to compensate for the uncertainty costs they bear.

Notwithstanding, in contrast to the net interest margin in conventional banking, which is composed solely of ex-ante elements, the net margin in Islamic banking comprises a combination of both ex-ante and ex-post elements (Hutapea & Kasri, 2010; Susamto et al., 2021). Islamic banks accept deposits in various forms, such as current accounts, savings accounts, and investment accounts. Current accounts are managed in the same manner as they are in traditional banks. Meanwhile, saving accounts offer Islamic banks a full guarantee of utilizing deposited funds, incentivizing them to provide a range of rewards to deposit holders. Investment accounts grant banks the liberty to utilize deposited funds without any guarantee, but they are obligated to share the profits earned with deposit holders, following a certain pre-established formula. As profits are contingent on Islamic banks' revenue from their financing activities, the precise rates of PLS payable to depositor holders are determined ex-post.

Regarding financing, Islamic banks have the flexibility to choose various contracts, including PLS contracts, sales contracts, lease contracts, and a combination of these contracts (Habib, 2018; Iqbal & Mirakhor, 2011). PLS contracts primarily include *mudarabah* and *musharakah*. M*udarabah* refers to a partnership in which the Islamic banks, as the financiers, contribute all capital and bear the losses when the losses happen. Profits are shared between Islamic banks and clients in a predetermined ratio. M*usharakah* entails a partnership in which all

parties contribute capital and proportionately share losses and profits. M*urabaha* and *istisna* form the sales contracts (Kayed, 2012). M*urabaha* is a cost-plus-profit agreement in which payments can be deferred, allowing clients to purchase more easily. I*stisna* emphasizes manufacturing or construction contracts that are adaptable to client specifications and allow for payment flexibility. Lease contracts, mostly in the form of *ijarah*, involve leasing assets for an agreed-upon period and consideration. The income derived from PLS contracts, which is dependent on the client's business performance, becomes known ex-post. By contrast, the income derived from sales contracts, lease contracts, or a combination of these contracts is established ex-ante.

Theoretically, the ex-post nature of PLS contracts contributes to an increase in uncertainty costs. This is because Islamic banks, which are confronted with an irregular influx of deposit supplies and fluctuating demands for financing, coupled with an unpredictable flow of income from PLS, may find it necessary to raise the net margin as a strategy to counterbalance the uncertainty costs. Consequently, all other factors being equal, a greater prevalence of PLS contracts may increase the net margin of Islamic banks (Susamto et al., 2021).

Moreover, the principal-agent arrangements in PLS contracts may also contribute to increased uncertainty costs. The principal-agent arrangements in PLS contracts make Islamic banks more prone to asymmetric information, adverse selection, and moral hazard problems (Adnan & Muhamad, 2013). Asymmetric information refers to a state in which one party has or will have greater knowledge than another party about their own characteristics or actions (Brown, 2016). As the principal, Islamic banks have less knowledge about the potential returns and associated risks of the project they finance than their clients, the agents. Conversely, being insiders, the clients as the agents have better knowledge about the project and about themselves, including their abilities and intentions (Nouman et al., 2018).

Before any project is initiated, adverse selection (Anton, 2018) is likely to occur: First, prospective clients expecting their projects to provide low profits and high non-monetary benefits are more likely to apply for PLS financing than other prospective clients with high-profit expectations and low non-monetary benefits as they will get high total returns at low cost of capital. Second, prospective clients expecting high profit from a risky project are more likely to apply for PLS financing than other prospective clients with low profit from a less risky project because their risk will be shared or even completely borne by the bank. Third, when the ratio of profit-sharing is decided on the basis of expected profit, it is more likely that prospective clients will inflate their declared profit expectation in the hope of the profit-sharing ratio being set low by the bank (Nouman et al., 2018).

After a project is initiated, a moral hazard (Zhang, 2018) is also likely to occur. Moral hazard in PLS contracts refers to the risk that the clients might be involved in activities that are undesirable from the banks' point of view (Nouman & Ullah, 2014). These problems are associated with the underreporting or artificial reduction of the actual profit, the misuse of the project's funds, and slack management. Mudarabah is more vulnerable to moral hazard problems than Musharakah. In Mudarabah, banks, as the financiers, have no right to interfere in the business but are required to bear all losses (Nouman et al., 2018).

However, it is possible that the increase in uncertainty costs is offset by a close and long-standing relationship between Islamic banks and their clients. PLS contracts may lead to a close and long-standing relationship between Islamic banks and their clients. This may foster an environment of trust over time, resulting in increased operational efficiency and reduced monitoring costs, which could potentially moderate the net margin required by Islamic banks to compensate for their role in financial intermediation. Furthermore, this relationship incentivizes Islamic banks' clients to ensure the profitability of the financed projects, thereby enhancing their overall quality of investments and reducing the need for a higher net margin.

Based on the above discussion, it is hypothesized that

H1: PLS financing has a positive and significant effect on the net margin of Islamic BPRs.

Turning to operating expenses. In addition to the PLS expenses payable to deposit holders that are equivalent to interest expenses in conventional banking, operating expenses in Islamic banking include expenses other than PLS expenses that are equivalent to non-interest expenses in conventional banking. These expenses other than PLS expenses include personnel, buildings, and equipment, as well as administrative and marketing expenses (Habib, 2018; Iqbal & Mirakhor, 2011). Operating expenses are indispensable for the day-to-day functioning of the banks and may differ from one bank to another due to variations in business models, strategies, and efficiency levels.

Drawing on the dealership model (Ho & Saunders, 1981; Maudos & Fernández de Guevara, 2004; Maudos & Solís, 2009), operating expenses theoretically affect the net margin of Islamic banks by increasing the banks' vulnerability to uncertainty costs. Similar to that in conventional banking, this increase in vulnerability in Islamic banking comes from the fact that higher operating expenses increase the buffers needed for banks to manage and navigate through unexpected shocks such as interest rate fluctuations, economic downturns, and regulatory changes. Higher operating expenses also decrease banks' flexibility and adaptability to different situations, such as market competition, technological advancements, and shifts in customer preferences. Thus, higher operating expenses necessitate a higher net margin to compensate for the uncertainty costs associated with providing financial intermediation services.

Empirical evidence tends to confirm that operating expenses matter for net margin in both conventional and Islamic banking (Lee & Isa, 2017; Maudos & Fernández de Guevara, 2004; Maudos & Solís, 2009; Susamto et al., 2021). Estimating separately the determinants of net margin in the Malaysian dual banking system over 2008-2014, Lee and Isa (2017) conclude that the effect of operating expenses on net margin is significant for both conventional and Islamic banks.

Based on the above discussions, it is hypothesized that

H2: Operating expenses has a positive and significant effect on the net margin of Islamic BPRs.

III. DATA AND METHODS

This paper uses an unbalanced panel dataset of 147 Islamic BPRs, constituting more than 90 percent of Islamic BPRs operating at the end of the analysis period. The panel spans annually from 2011 to 2021. The selection of Islamic BPRs in the sample is based on at least two criteria. First, only Islamic BPRs that are in operation for at least five years and are not recently merged are considered. Second, only those with three or more years of relevant data are selected.

Following the research tradition of Ho and Saunders (1981) and the extended model of Maudos and Solís (2009), this paper formulates a regression equation as follows.

$$M_{i,p,t} = \beta_0 M_{i,p,t-1} + \beta_1 F_{i,p,t} + \beta_2 E_{i,p,t} + \sum_{j=1}^{J} \beta^j B_{i,p,t}^j + \sum_{k=1}^{K} \beta^k O_{p,t}^k + \epsilon_{i,p,t} \quad (1)$$

In this equation, the dependent variable, *M*, refers to the net margin of bank *i* that is located in province *p* at the end of period *t*. It is calculated as the ratio to productive assets of the difference between financing income and the PLS payable to deposit holders. *F* and *E* denote the two key independent variables of interest, PLS financing and operating expenses, respectively. *B* denotes bank-specific control variables, which include variables traditionally viewed as pure spread determinants, variables viewed as non-pure spread determinants, and a dummy for government ownership. *O* denotes macroeconomic and other control variables. β represents the parameters to be estimated, ε represents the error term, and the superscripts j and k refer respectively to the variables *j*-th and *k*-th in each control variable category.

PLS financing, as the key independent variable of interest, is measured using two alternative proxies. The first proxy refers to the ratio of PLS financing to total financing (PLS financing 1). The second proxy refers to the Herfindahl-Hirschman index of PLS and non-PLS financing (PLS financing 2). Operating expenses, as the other key independent variable of interest, are also measured using two alternative proxies. The first proxy refers to the ratio to a bank's total assets of the bank's total operating expenses minus PLS expenses (operating expenses 1). This is equal to the ratio to a bank's total assets of the bank's operating expenses other than PLS expenses. The operating expenses other than PLS expenses include personnel, buildings, and equipment, as well as administrative and marketing expenses that are equivalent to non-interest expenses in conventional banking. The second proxy refers to the ratio to total assets of total operating expenses (operating expenses 2). This proxy includes both PLS expenses payable to deposit holders and other expenses other than PLS expenses.

Table 1.
Description of Variables

Variable name	Variable descriptions
Dependent Variables	
Net margin	The ratio to a bank's productive assets of the difference between the bank's financing income and PLS payable to deposit holders.
Key Variable of Interest	
PLS financing (1)	The ratio of a bank's PLS financing to the bank's total financing.
PLS financing (2)	The Herfindahl-Hirschman index of a bank's PLS and non-PLS financing.
Operating expenses (1)	The ratio to a bank's total assets of the bank's total operating expenses minus PLS expenses. This is equal to the ratio to a bank's total assets of the bank's operating expenses other than PLS expenses.
Operating expenses (2)	The ratio to a bank's total assets of the bank's total operating expenses.
Pure spread determinants	
Degree of risk aversion	The ratio of a bank's total equity to the bank's total assets.
Transaction size	The natural logarithm of a bank's gross total financing.
Financing-loss provisions	The ratio of a bank's financing-loss provisions to the bank's gross total financing.
Non-financing income	The ratio of a bank's non-financing income to the bank's total operating income.
Market power index	The difference between a bank's total income and total expenses divided by the bank's total income.
Other bank-specific variables	
Implicit payments	The difference between total operating expenses and non-interest income in terms of total assets.
O.cost of holding reserves	The ratio of a bank's liquid assets to the bank's total assets.
Fin. Specialization	The ratio of a bank's total financing to the bank's total assets.
D. government-own.	The dummy for government ownership, taking the value 1 if a bank is owned by one or more local governments, 0 otherwise.
Other control variables	
Real GDP growth rates	The percentage change in the provincial real gross domestic product.
Inflation rates	The percentage change in the provincial consumer price index.
D. Covid-19 pandemic	The dummy for the Covid-19 pandemic, taking the value 1 for the year 2020, 0 otherwise.
D. province fixed effects	The Dummies for the province fixed effects, taking the value 1 for each corresponding province, 0 otherwise.
D. year fixed effects	The Dummies for the year fixed effects, taking the value 1 for each corresponding year, 0 otherwise.

Bank-specific control variables traditionally viewed as pure spread determinants include the degree of risk aversion, transaction size, credit risk, non-financing income, and market power. Risk aversion is proxied by the equity to total assets ratio, whereas transaction size is measured as the natural logarithm of the financing amount. Credit risk is measured as the ratio to total financing of financing-loss provisions, non-financing income is calculated as the ratio of non-financing income to total operating income, and market power is proxied by the

Lerner index. This index reflects a bank's ability to set prices above its marginal cost and ranges from 0, representing perfect competition, to 1, denoting a monopoly.

Bank-specific control variables that are viewed as non-pure spread determinants include implicit interest payments, the opportunity cost of holding reserves, and financing specialization. Implicit interest payments are the difference between total operating expenses and non-interest income in terms of total assets (IIP). The opportunity cost of holding reserves is measured as the ratio to total assets of liquid assets, while financing specialization is measured as the ratio of total financing to total assets. On top of these three variables, Maudos and Solis (2009) include management quality as another variable viewed as a non-pure spread determinant. However, a preliminary look at the panel indicates that this variable highly correlates with the Lerner index. Management quality is, hence, excluded from the regressions. The preliminary look at the panel also indicates that there are extreme values in the dataset. To address this issue, all variables specific to the banks were adjusted using a three-fold interquartile range as the threshold.

The macroeconomic and other control variables include the real gross domestic product (GDP) growth rates and the inflation rates. In addition, the dummy for the Covid-19 pandemic, dummies for province-fixed effects, and dummies for year-fixed effects are also included.

Data for bank-specific variables were obtained from each bank's financial reports, as provided by the Indonesian Banking Services Authority (OJK). Data on macroeconomic variables are obtained from Statistics Indonesia (BPS).

Bank-specific control variables are assumed to be weakly exogenous to net margin. Although these variables' past and current values do not correlate with the error terms, their future values do. To avoid inconsistency in fixed-effect estimators due to the inclusion of these variables and a lag of the dependent variable in equation (1), this paper employs the system generalized method of moments (GMM) estimators (Blundell & Bond, 2000).

These GMM estimators are justified only if there is no correlation between the instruments and residuals and if there is no second-order serial correlation in the error terms. The Hansen tests of over-identification and the Arellano-Bond tests of zero autocorrelation are carried out to validate these assumptions.

IV. RESULTS AND DISCUSSION

Table 2 presents descriptive statistics and provides an overview of the variables' means, standard deviations, and minimum and maximum values. The mean of the net margin is positive, indicating generally positive intermediation costs. The relatively modest standard deviation compared to the mean indicates that, while there is some variability across observations, the variability is not excessively large.

The multicollinearity diagnosis is presented in Table 3, where the correlation coefficients between the variables are displayed. The correlation coefficients between the variables are relatively low, alleviating concerns about multicollinearity.

Table 2.
Descriptive Statistics

Variable name	N obs.	Mean	Std. dev.	Min.	Max.
Net PLS margin	1,457	0.101	0.037	-0.040	0.246
PLS financing (1)	1,457	0.117	0.144	0.000	0.648
PLS financing (2)	1,457	0.836	0.164	0.500	1.000
Operating expenses (1)	1,457	0.105	0.054	0.024	0.674
Operating expenses (2)	1,457	0.154	0.049	0.028	0.331
Degree of risk aversion	1,457	0.171	0.104	-0.043	0.541
Transaction size	1,457	16.872	1.253	12.116	20.849
Financing-loss provisions	1,457	0.015	0.012	0.000	0.054
Non-financing income	1,457	0.901	0.068	0.668	1.000
Market power index	1,457	0.098	0.173	-0.429	0.471
Implicit payments	1,457	-0.000	0.002	-0.006	0.006
O.cost of hold. Reserves	1,457	1.232	1.160	0.000	5.535
Fin. specialization	1,457	0.703	0.118	0.253	0.979
Real GDP growth rates	1,457	4.513	2.724	-4.500	21.760
Inflation rates	1,457	3.902	2.320	0.060	11.900
D. government-own.	1,457	-	-	0.000	1.000
D. Covid-19 pandemic	1,457	-	-	0.000	1.000
D. province fixed effects	1,457	-	-	0.000	1.000
D. year fixed effects	1,457	-	-	0.000	1.000

Note: N obs. = Number of observations; Std. dev. = Standard deviation; Min. = Minimum values; Max. = Maximum values.

Table 3.
Multicollinearity Diagnostics

	NPM	PLS1	NETA	EQTA	LFIN	FLP	NNII	MPI	IIP	OCHR	FSPE	GGDP	INFL	DGO
NPM	1.000													
PLS1	-0.248	1.000												
NETA	0.535	-0.154	1.000											
EQTA	0.338	-0.173	0.119	1.000										
LFIN	-0.298	0.173	-0.507	-0.297	1.000									
FLP	0.188	-0.103	0.427	0.029	-0.115	1.000								
NNII	0.184	-0.071	-0.271	-0.010	0.134	-0.020	1.000							
MPI	0.241	-0.036	-0.578	0.197	0.337	-0.287	0.186	1.000						
IIP	0.045	-0.018	-0.086	0.045	0.024	-0.095	-0.045	0.028	1.000					
OCHR	0.111	-0.074	0.196	0.058	-0.326	0.014	-0.010	-0.141	-0.086	1.000				
FSPE	0.162	0.067	-0.050	-0.130	0.401	0.076	0.086	0.177	0.033	-0.188	1.000			
GGDP	0.191	-0.011	0.092	0.046	-0.132	0.069	0.026	0.084	-0.026	0.094	0.080	1.000		
INFL	0.188	-0.042	0.149	0.059	-0.182	0.102	-0.029	0.028	-0.031	0.101	0.104	0.329	1.000	
DGO	0.063	-0.150	-0.068	0.432	0.147	0.081	0.089	0.158	-0.003	0.038	0.051	-0.010	-0.004	1.000

Note: NPM = Net PLS margin; PLS1 = PLS financing (1); NETA = Operating expenses (1); EQTA = Degree of risk aversion; LFIN = Transaction size; FLP = Financing-loss provisions; NNII = Non-financing income; MPI = Market power index; IIP = Implicit payments; OCHR = Opp. cost of holding reserves; FSPE = Financing specialization; GGDP = Real GDP growth rates; INFL = Inflation rates; DGO = D. government-owned bank.

4.1. Regression Results

Table 4 presents the results of the baseline regressions. Each column in this Table displays a distinct regression model that progressively builds on the preceding model. Notably, the model stands well against the established evaluative criteria set by the Hansen tests of over-identification and satisfactorily passes the benchmark set forth by the Arellano-Bond tests for zero autocorrelation.

Table 4.
Results from the Baseline Regressions

	System GMM estimators					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.Net PLS margin	0.173***	0.169***	0.180***	0.180***	0.170***	0.182***
	(0.039)	(0.040)	(0.031)	(0.041)	(0.041)	(0.031)
PLS financing (1)	-0.009	-0.010	-0.003			
	(0.010)	(0.010)	(0.008)			
PLS financing (2)				0.015*	0.014	0.008
				(0.009)	(0.008)	(0.007)
Operating expenses (1)	0.654***	0.656***	0.618***	0.646***	0.645***	0.613***
	(0.078)	(0.074)	(0.063)	(0.078)	(0.076)	(0.060)
Degree of risk aversion	0.044**	0.033**	0.029**	0.043**	0.033**	0.031**
	(0.017)	(0.016)	(0.014)	(0.017)	(0.016)	(0.015)
Transaction size	0.001	0.000	-0.002	0.001	0.000	-0.001
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Financing-loss provisions	0.022	-0.057	-0.080	0.031	-0.058	-0.077
	(0.088)	(0.089)	(0.080)	(0.087)	(0.089)	(0.079)
Non-financing income	0.196***	0.175***	0.176***	0.194***	0.171***	0.174***
	(0.017)	(0.019)	(0.016)	(0.018)	(0.019)	(0.016)
Market power index	0.137***	0.139***	0.135***	0.137***	0.136***	0.134***
	(0.015)	(0.015)	(0.012)	(0.014)	(0.016)	(0.012)
Implicit payments		1.759***	1.680***		1.711***	1.650***
		(0.222)	(0.216)		(0.228)	(0.225)
O.cost of hold. reserves		-0.000	-0.000		-0.000	-0.000
		(0.001)	(0.001)		(0.001)	(0.001)
Fin. specialization		0.031***	0.032***		0.032***	0.034***
		(0.011)	(0.011)		(0.011)	(0.011)
Real GDP growth rates			0.000			0.000
			(0.000)			(0.000)
Inflation rates			-0.001			-0.001
			(0.001)			(0.001)
D. government-own.	-0.015	-0.002	-0.005	-0.010	-0.001	-0.004
	(0.012)	(0.009)	(0.006)	(0.012)	(0.010)	(0.006)
D. Covid-19 pandemic	Yes	Yes	Yes	Yes	Yes	Yes
D. Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
D. Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 4.
Results from the Baseline Regressions (Continued)

	System GMM estimators					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
N observations	1,457	1,457	1,457	1,457	1,457	1,457
N banks	147	147	147	147	147	147
AR(2) (p-value)	0.136	0.349	0.450	0.137	0.358	0.434
Hansen (p-value)	0.557	0.230	0.421	0.505	0.158	0.292

Note: The key independent variable of interest is the net margin. Each regression includes a constant. The values reported for each variable are coefficients and heteroskedasticity-robust standard errors clustered at the bank level. *, **, and *** denotes significance at the 10, 5, and 1 percent level.

In column 1, the regression includes the ratio of PLS financing to total financing as a proxy for PLS financing and the ratio of total operating expenses to total assets as a proxy for operating expenses. The regression also includes one lag of the dependent variable, bank-specific control variables traditionally viewed as pure spread determinants, and four dummy control variables. The regression in column 2 broadens the scope of the analysis by incorporating bank-specific control variables that are traditionally viewed as non-pure spread determinants. In column 3, the two macroeconomic control variables are added. By examining the coefficients of the key independent variables of interest and their associated standard errors, it is evident that PLS financing does not significantly affect the net margin of Islamic BPRs. From columns 1 to 3, the coefficient of PLS financing is not significant, even at the 10 percent level. Regarding operating expenses, the results show the effect of this variable on the net margin of Islamic BPRs is always positive and statistically significant at the 1 percent level. Higher operating expenses lead to higher net margins.

In columns 4 through 6, the regressions include the Herfindahl-Hirschman index of PLS and non-PLS financing instead of the ratio of PLS financing to total financing as a proxy for PLS financing. The remainder of the variables remain the same as those in columns 1 through 3. The coefficient of PLS financing is statistically significant at the 10 percent level in column 4 but not significant in columns 5 through 6, necessitating the weak effect that PLS financing has on the net margin of Islamic BPRs. By contrast, in all of these three columns, the coefficient of operating expenses remains persistently positive and statistically significant at the 1 percent level. Holding other variables constant, higher operating expenses lead to a higher net margin for Islamic BPRs.

Table 5 further presents the results of the regression analysis. Each column in this Table displays a distinct model similar to that in each corresponding column in Table 4. However, instead of the ratio of non-PLS expenses to total assets, the ratio of total operating expenses to total assets is used as a proxy for operating expenses. The p-values obtained from the Hansen tests of over-identification and the Arellano-Bond tests for zero autocorrelation indicate that the models are valid.

Upon closely examining the coefficients of the key independent variables of interest in columns 1 through 3, where the ratio of PLS financing to total financing is used as a proxy for PLS financing, it is evident that the effect of PLS financing

on the net margin of Islamic BPRs is not statistically significant. Meanwhile, in the same three columns, the coefficient of operating expenses is always positive and statistically significant at the 1 percent level. Holding other variables constant, an increase in operating expenses increases the net margin of Islamic BPRs.

Table 5.
Results from Regressions with an Alternative Measure of Operating Expenses

	System GMM estimators					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.Net PLS margin	0.310**	0.316***	0.318***	0.316***	0.333***	0.331***
	(0.130)	(0.071)	(0.076)	(0.117)	(0.067)	(0.071)
PLS financing (1)	0.028	0.017	0.016			
	(0.020)	(0.017)	(0.018)			
PLS financing (2)				-0.003	-0.001	0.002
				(0.004)	(0.002)	(0.007)
Operating expenses (2)	0.388***	0.349***	0.335***	0.368***	0.348***	0.340***
	(0.120)	(0.070)	(0.082)	(0.107)	(0.078)	(0.089)
Degree of risk aversion	0.112***	0.088**	0.084**	0.116***	0.078**	0.076**
	(0.041)	(0.036)	(0.037)	(0.042)	(0.034)	(0.035)
Transaction size	-0.006	-0.011**	-0.012**	-0.007	-0.012**	-0.013**
	(0.007)	(0.005)	(0.005)	(0.007)	(0.005)	(0.005)
Financing-loss provisions	-0.095	-0.049	0.006	-0.007	0.050	0.105
	(0.350)	(0.206)	(0.219)	(0.316)	(0.202)	(0.209)
Non-financing income	0.190***	0.147***	0.150***	0.190***	0.145***	0.150***
	(0.048)	(0.040)	(0.052)	(0.046)	(0.045)	(0.056)
Market power index	0.079**	0.080***	0.080***	0.077***	0.085***	0.085***
	(0.035)	(0.019)	(0.022)	(0.027)	(0.019)	(0.023)
Implicit payments		0.975*	0.807		0.945	0.817
		(0.561)	(0.599)		(0.579)	(0.618)
O.cost of hold. reserves		0.000	0.001		0.000	0.001
		(0.002)	(0.002)		(0.003)	(0.002)
Fin. specialization		0.025	0.028		0.028	0.028
		(0.021)	(0.021)		(0.022)	(0.022)
Real GDP growth rates			0.000			0.000
			(0.001)			(0.001)
Inflation rates			-0.002			-0.002
			(0.002)			(0.001)
D. government-own.	-0.026	-0.023	-0.019	-0.026	-0.022	-0.017
	(0.057)	(0.019)	(0.016)	(0.052)	(0.019)	(0.016)
D. Covid-19 pandemic	Yes	Yes	Yes	Yes	Yes	Yes
D. province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
D. year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 5.
Results from Regressions with an Alternative Measure of Operating Expenses (Continued)

	System GMM estimators					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
N observations	1,457	1,457	1,457	1,457	1,457	1,457
N banks	147	147	147	147	147	147
AR(2) (p-value)	0.259	0.474	0.490	0.260	0.498	0.488
Hansen (p-value)	0.949	0.556	0.444	0.966	0.663	0.557

Note: The key independent variable of interest is the net margin. Each regression includes a constant. The values reported for each variable are coefficients and heteroskedasticity-robust standard errors clustered at the bank level. *, **, and *** denotes significance at the 10, 5, and 1 percent level.

The regressions in columns 4 through 6 include the Herfindahl-Hirschman index of PLS and non-PLS financing as a proxy for PLS financing. The remainder of the regression variables remain the same as those in columns 1 through 3. The coefficient of PLS financing remains statistically insignificant, necessitating the weak effect that PLS financing has on the net margin of Islamic BPRs. The coefficient of operating expenses remains persistently positive and significant at the 1 percent level. Thus, increased operating expenses are associated with a corresponding increase in the net margin of Islamic BPRs.

Some additional analyses with different regression models confirm that the effect of PLS financing on the net margin of Islamic BPRs is not significant or, at best, not robust. These additional analyses also confirm that the effect of operating expenses on the net margin of Islamic BPRs remains positive and statistically significant. Including management quality that has been kept out due to the multicollinearity issue in the regressions above or adding a dummy each for, respectively, shariah-supervisory-board-member ownership, commissioner-board-member ownership, and management ownership does not change the main results (detailed results are available with the authors upon request).

4.2. Discussion

The findings from the regressions above, particularly concerning how PLS financing affects net margin, align with Widarjono et al. (2023). Despite the ex-post nature of PLS contracts and despite the principal-agent arrangements that heighten the susceptibility of Islamic BPRs to the problems of asymmetric information, adverse selection, and moral hazard, the effect of PLS financing on the net margin of Islamic BPRs is not significant.

It cannot be determined whether the insignificance is because Islamic BPRs have opted to overlook the increase in uncertainty costs and forgone additional net margin that could compensate for their role in financial intermediation or because the increase in uncertainty costs is offset by a close and long-standing relationship between Islamic BPRs and their clients that fosters an environment of trust and results in increased operational efficiency. However, at the very least, the findings from the regression analysis above illuminate evidence that the efforts to

promote PLS contracts will not necessarily bring about a detrimental effect in the form of an increased net margin of Islamic BPRs. Thus, promoting PLS contracts can be navigated with a sense of confidence without the overarching concern of inadvertently higher intermediation costs in Islamic banking.

Further, the finding that operating expenses have a robustly significant positive effect on net margin is consistent with the theoretical prediction and the empirical finding by Maudos and Fernandez de Guevara (2004), Maudos and Solis (2009), and Lee and Isa (2017). Operating expenses seem to have affected the net margin of Islamic BPRs by increasing the Islamic BPRs' vulnerability to uncertainty costs and decreasing their flexibility and adaptability to different situations, necessitating a higher net margin to compensate for the uncertainty costs associated with providing financial intermediation services.

This finding underscores the need for more serious efforts aimed at improving the effectiveness of Islamic BPRs' expense management. Such efforts will not only reduce the operating expenses of Islamic BPRs, but also their intermediation costs.

V. CONCLUSION

This paper examines the effect of PLS financing and operating expenses on Islamic local banks' intermediation costs, as proxied by net margin. It uses dynamic panel regressions for a sample of 147 Islamic BPRs in Indonesia over the period 2011-2021. The main finding is that the effect of PLS financing on the net margin of Islamic BPRs is mostly not significant. By contrast, the effect of operating expenses on the net margin of Islamic BPRs is significantly positive and robust to different regression models.

These findings illuminate evidence that, at the very least, the efforts to promote PLS contracts will not necessarily bring about a detrimental effect in the form of an increased net margin for Islamic banks. Thus, promoting PLS contracts can be navigated confidently without the overarching concern of inadvertently higher intermediation costs in Islamic banking. The findings also illuminate evidence that what matters more for the intermediation costs of Islamic banks are operating expenses. If reducing the intermediation costs of Islamic banks is a desirable policy goal, then there is a compelling case for policymakers and bank managers to prioritize strategies to reduce operating expenditures and improve operational efficiency. Examining the specific strategies that can be best employed to reduce operating expenditures and improve the operational efficiency of Islamic banks' cost management is beyond the scope of this paper.

This paper limits its focus to Islamic BPRs in Indonesia. Future studies may need to examine the effect of PLS financing and operating expenses on the intermediation costs of other types of Islamic banks in Indonesia and other countries. Future studies may also need to explore various strategies and steps that can be taken to reduce the intermediation costs of Islamic local banks, including ones to improve the effectiveness of Islamic banks' cost management.

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