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Benchmarking the Intermediation Costs of Islamic and Conventional Banks: Evidence from Indonesia

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ABSTRACT

The number of studies examining the intermediation costs of Islamic banking remains limited. This paper aims to benchmark the intermediation costs of Islamic and conventional banks as measured by net profit or net interest margin. The question to be answered is whether the level of net margin is higher or lower in Islamic than in conventional banking. This paper relies on the system generalized method of moments (GMM) panel regression, in which net margin is treated as a function of "pure spread" determinants, bank-specific variables not formally seen as "pure spread" determinants, and macroeconomic conditions. The sample includes unbalanced panel data from 12 Islamic and 97 conventional banks in Indonesia over 2004-2018. The results indicate no strong evidence that the level of net margin in Islamic banking differs from that in conventional banking. The difference between net margins in the two banking systems is at best not robust. It is subject to the inclusion of different control variables, the composition of the sample, and, most importantly, outliers. Both anecdotal beliefs saying that Islamic banking is more costly and an opposing claim that Islamic banking brings about a promise for lower intermediation costs should not be taken for granted.

ملخص

لا يزال عدد الدراسات التي تتناول تكاليف الوساطة في الصيرفة الإسلامية محدودا. وتهدف هذه الورقة إلى قياس تكاليف الوساطة للبنوك الإسلامية والتقليدية مقاسة بصافي الربح أو صافي هامش الفائدة. والسؤال الذي يجب الإجابة عليه هو ما إذا كان مستوى صافي الهامش أعلى أو أقل في البنوك الإسلامية

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منه في البنوك التقليدية؟. وتعتمد هذه الورقة على طريقة نظام أسلوب اللحظات المعمم ((GMM، حيث يتم التعامل مع صافي الهامش كدالة لمحددات "بيور سبريد"، والمتغيرات الخاصة بالبنك التي لا يُنظر إليها رسميا على أنها محددات "بيور سبريد"، وظروف الاقتصاد الكلي. وتشمل العينة بيانات لوحة غير متوازنة من 12 مصرفا إسلاميا و 97 مصرفا تقليديا في إندونيسيا خلال فترة 2004-2018. وتشير النتائج إلى عدم وجود دليل قوي على أن مستوى صافي الهامش في البنوك الإسلامية يختلف عن مثيله في البنوك التقليدية. والفرق بين صافي الهوامش في النظامين البنكيين ليس قويا في أحسن الأحوال.فهو يخضع لإدراج متغيرات تحكم مختلفة، وتكوين العينة، والأهم من ذلك، لاستثناءات. ولا ينبغي أن يعتبر كل من المعتقد الذي مفاده أن الخدمات المصرفية الإسلامية أكثر تكلفة، والادعاء المعارض بأن الخدمات المصرفية الإسلامية تقدم وعدا بتكاليف وساطة أقل على أنهما أمر مسلم به.

ABSTRAITE

Le nombre d'études examinant les coûts d'intermédiation de la banque islamique reste limité. Ce document vise à comparer les coûts d'intermédiation des banques islamiques et conventionnelles, mesurés par le bénéfice net ou la marge d'intérêt nette. La question à laquelle il faut répondre est de savoir si le niveau de la marge nette est plus ou moins élevé dans la banque islamique que dans la banque conventionnelle. Ce document s'appuie sur la régression par panel de la méthode des moments généralisés (GMM), dans laquelle la marge nette est traitée comme une fonction des déterminants du " pure spread ", des variables spécifiques aux banques qui ne sont pas formellement considérées comme des déterminants du " pure spread ", et des conditions macroéconomiques. L'échantillon comprend des données de panel non équilibrées provenant de 12 banques islamiques et de 97 banques conventionnelles en Indonésie entre 2004 et 2018. Les résultats n'indiquent aucune preuve solide que le niveau de la marge nette dans la banque islamique diffère de celui de la banque conventionnelle. La différence entre les marges nettes des deux systèmes bancaires n'est au mieux pas robuste. Elle est soumise à l'inclusion de différentes variables de contrôle, à la composition de l'échantillon et, surtout, aux valeurs aberrantes. Il ne faut pas tenir pour acquis les croyances anecdotiques selon lesquelles la banque islamique est plus coûteuse, ni l'affirmation opposée selon laquelle la banque islamique promet une baisse des coûts d'intermédiation.

Keywords: Bank; Islamic bank; Net interest margin; Dealership model

JEL Classification: G21; L10

1. Introduction

Net interest margin is naturally of economists' interest. In a way, it reflects banks' profitability (Bennaceur and Goaied 2008; Demirgüç-Kunt, Laeven, and Levine 2004). In another way, it can be seen as a measure of financial intermediation costs (Poghosyan, 2013; Jarmuzek and Lybek, 2020). A higher net interest margin implies higher rates charged for credits, or lower returns for deposits, or both. A higher net interest margin, thus, impedes financial intermediation and, as a consequence, slows down economic growth.

Extensive studies have examined the nature of net interest margin in conventional banking and its driving factors. Ho and Saunders (1981) proposed a theoretical model in which risk-averse banks are faced with uncertainty costs and require margin to compensate for the costs. Within the static micro-model of banking firms, Zarruk and Madura (1992) proposed a different model assuming that banks are subject to the prevailing capital regulation and deposit insurance. Later studies are mostly empirical. These comprise the studies by Maudos and Fernández de Guevara (2004), Valverde and Fernández (2007), Lepetit et al. (2008), and Maudos and Solís, (2009) which cover cross-country data, and the studies conducted by Fungáčová and Poghosyan, (2011), Doyran (2013), Entrop et al. (2015), Amuakwa-Mensah and Marbuah (2015) and Le (2017) which focus on one-single country data. The findings highlight several factors which affect bank margins, ranging from bank-specific to macroeconomic and institutional factors.

The spread of Islamic banking (IFSB, 2018) raises a question as to whether net profit margin –i.e. Islamic banks' ratio equivalent to conventional banks' net interest margin– is of the same nature and driven by the same factors as net interest margin. Besides, it raises a question as to whether the level of net margin in Islamic banking has been empirically higher or lower than that in conventional banking. Popular anecdotal belief tends to say that Islamic banking is more costly (e.g. Kuran 1996). By contrast, there is also an opposing claim that Islamic banking brings about a promise for lower intermediation costs (Chapra, 1982; Siddiqi, 1983).

Economically, Islamic banks have a similar function to the conventional banks (Habib, 2018). They serve as a financial intermediary, which receives deposits, provides financing and offers a variety of other

services. Nonetheless, different from conventional banks, Islamic banks profess to comply with the rules and regulations derived from Islamic principles. These include the prohibition of a predetermined rate of interest, promotion of profit and loss sharing and emphasis on social solidarity (Askari, Iqbal and Mirakhor, 2015; Habib, 2018).

Studies examining net margin in Islamic banking are rare. Important examples include the studies by Bashir (2003), Malim, Ibrahim and Rasid (2017) and Malim and Normalini (2018). Hutapea and Kasri (2010), Sun et al. (2014), Lee and Isa (2017) and Bougatef and Korbi (2018) attempt to investigate the determinants of net margin in Islamic and conventional banking, but none of them make a direct comparison between the level of net margin in these two banking systems. Using bank-level data from Malaysia, Ibrahim and Law (2019) compared the level of net margins in Islamic and conventional banking and reported that it is higher in the former than in the latter.

This paper aims to add to the literature in this context. It directly benchmarks the level of net margin in Islamic and conventional banking. The question to be answered is whether, holding all other factors constant, the level of net margin is higher or lower in Islamic than in conventional banking. This paper makes uses of unbalanced bank-level panel data from Indonesia, where an established dual (Islamic and conventional) banking system exists for over two decades. The primary finding suggests no evidence that the level of net margin in Islamic banking differs from that in conventional banking. The difference between net margins in the two banking systems is at best not robust and subject to the inclusion of different control variables, the composition of the sample, and most importantly, outliers.

This paper is important in at least two ways. Firstly, in addition to the work by Ibrahim and Law (2019), this paper is among the first to compare the level of net margin in Islamic and conventional banking. This paper differs from those conducted by Hutapea and Kasri (2010), Sun et al. (2014) and Lee and Isa (2017) in which they focused on investigating the determinants of net margin rather than comparing the level of net margin. This paper also differs from other works (e.g. Beck, Demirgüç-Kunt and Merrouche, 2013; Mobarek and Kalonov, 2014; Yanikkaya, Gümüş and Pabuçcu, 2018) comparing Islamic and conventional banks as it concentrates on the level of net margin instead of business model, performance, or risk-taking. Secondly, this paper expands on the thin

literature examining net margin in Indonesia. Other than the study by Hutapea and Kasri (2010), notable studies on net margin in Indonesia include the works by Trinugroho, Agusman, and Tarazi (2014) and Raharjo et al. (2014). The current paper differs from these studies in that it covers both Islamic and conventional banking, makes a direct comparison between the level of net margin in these two banking systems, and covers a larger sample size.

The following section reviews the current literature and develops a hypothesis. Section three describes the details of the data, variables and methods used in the analysis. Section four summarizes and discusses the empirical results. Finally, section five concludes and presents recommendations.

2. Literature Review

To explain the nature of net margin in Islamic banking and to analyze whether the level of net margin in Islamic is higher or lower than that in conventional banking, it is important to first comprehend the ideas behind Islamic banking. This starts from the highest principle of Islam, the oneness of God (*tawhid*) (Choudhury and Hussain, 2005). Such principle requires Muslims not only to acknowledge God as the creator and the supreme commander of the universe, but also to comply with His divine laws called shariah. The shariah, which is derived from the Quran and the Sunnah (the life and sayings of His messenger), covers all aspects of human life, including economic matters. Based on the shariah Muslims justify the prohibition of interest, promotion of profit and loss sharing and emphasis on social solidarity.

In Islam, money is a medium of exchange as well as a unit of account. Money is, however, neither a commodity nor a store of value. It does not in itself have value. Money cannot be bought or sold on credit (Ahmad and Hassan, 2006). If, in any case, money has to be exchanged for money, the amount paid on both sides must be equal. Similarly, if the money has to be loaned and (later) returned, the amount loaned and returned must be equal. Otherwise, the additional payment will be considered as *riba* which is unlawful in Islam (Habib, 2018). Thus, earning money from money – as in the case of interest in conventional banking– is against the Islamic principles.

Islam recognizes money as a form of capital, only when the money is treated as an actual capital that is combined with other resources to carry out productive investment activities. The owner of the money is to be compensated only for returns resulting from such productive activities and not simply from the passage of time (Askari, Iqbal and Mirakhor, 2015; Habib, 2018).

Instead of the creditor-debtor relationship, the operation of Islamic banks is based on profit and loss sharing contracts. The model that can best represent this idea is the two-tier *mudarabah* model (Askari, Iqbal and Mirakhor, 2015). In this model, the operation of an Islamic bank involves three parties, i.e. the surplus economic actors as an ultimate financier, the bank as a financial intermediary and the actors in deficit that ultimately require funds. M*udarabah* is a special form of partnership where a party acts as a financier or fund provider and the other party acts as an entrepreneur managing the funds. The bank acts as an entrepreneur when it receives funds from the surplus economic actors and, by the same token, as a financier when it provides the funds to the actors in deficit. In both cases, the contract is based on profit and loss sharing mechanisms. Net-losses from the second tier contract will be passed on to the bank, which will further pass it to the depositors according to the first tier contract. Meanwhile, net-profits from the second tier contract will be shared with the bank and, then, the bank will share it with the depositors according to the agreed proportion in the first-tier contract.

Thus, different from conventional banks, Islamic banks will theoretically perform intermediation on a pass-through basis (Askari, Iqbal and Mirakhor, 2015). The returns on assets –regardless of whether positive or negative– are passed by Islamic banks to investors and depositors, creating an embedded spirit of risk-sharing and solidarity.

To benchmark the level of net margin in Islamic and conventional banking, this paper relies on the dealership model originally pioneered by Ho and Saunders (1981). The model suggests that risk-averse banks are faced with uncertainty costs and that the banks require a positive net margin as the price of their intermediation service. The net margin will always be positive as long as uncertainty costs remain to exist. The margin is therefore called, “pure spread”. The original model predicts that, the higher the degree of banks’ risk-aversion, the larger their required net margin is. Besides, the original model predicts that larger sizes of a transaction, more concentrated market structures, and greater variances of

interest rates are all associated with a larger net margin. However, despite its intuitive appeal, the original model by Ho and Saunders (1981) has been viewed as too restrictive (e.g. Maudos and Fernández de Guevara, 2004; Valverde and Fernandez, 2007; Maudos and Solís, 2009). Rather than restricted to the original version, this paper therefore also uses an extended version of the model, particularly the one by Maudos and Solís (2009). The extended version postulates that the level of net margin is a function of pure spread determinants, bank-specific variables not formally seen as pure spread determinants, and other variables representing macroeconomic conditions.

The use of the bank dealership model in Islamic banking context is justified based on several assumptions. The first is that, similar to their conventional counterparts and despite Islamic principles' emphasis on social solidarity, Islamic banks aim to maximize their expected utility of wealth. The second assumption is that Islamic banks are faced with uncertainty costs that are comparable to the uncertainty costs faced by conventional banks. The third assumption is that Islamic banks are, like conventional banks, risk-averse and require net margin to compensate for the uncertainty costs they face.

Different from net margin in conventional banking which consists of only ex ante elements, net margin in Islamic banking consists of ex ante as well as ex post elements (Hutapea and Kasri, 2010). Islamic banks receive deposits in the forms of current accounts, saving accounts and investment accounts. Current accounts are treated by Islamic banks just in the same way as they are treated by conventional banks. Saving accounts allow Islamic banks to use the money with a full amount guarantee. For that reason, many Islamic banks offer different kinds of rewards to the depositors even though they are not obliged to do so. Investment accounts allow Islamic banks to use the money without any guarantee. The banks, however, are obliged to share the profits they earn to the depositors based on a certain formula. Since the value of the profits depends on the business of the banks, the exact rates of profit and loss sharing paid to depositors are only known ex post. On the financing side, Islamic banks may use debt-like instruments such as *murabahah* (mark-up financing) or *bai-muajjal* (the sale of goods and services on a deferred payment basis), profit and loss sharing instruments such as *mudarabah* (profit and loss sharing partnership) or *musharakah* (joint venture), and other instruments such as *ijarah* (renting contract). The stream of income from debt-like instruments is known ex ante. By contrast, the stream of income from

profit and loss sharing instruments depends on the business of banks' clients. It is only known ex post.

Theoretically, the presence of ex post elements can increase uncertainty costs. Banks are now faced with not only the asymmetric arrival of deposit supplies and financing demands, but also the undefined stream of income from profit and loss sharing instruments. This may increase the level of net margin that is required by banks to compensate for their costs. Thus, taking other things constant, the level of net margin in Islamic banking is likely higher than that in conventional banking.

By contrast, the spirit of risk sharing and solidarity may help reduce the net margin in Islamic banking. It may even push down the margin to a lower level than the net interest margin in conventional banking. Faced with higher uncertainty costs, Islamic banks have an option to simply pass through the costs to investors and depositors. This may relieve them from the uncertainty cost pressure and maintain net margin in Islamic banking at a lower level.

However, findings from previous studies have indicated that Islamic banks' depositors are guided by economic motives (Haron and Ahmad 2000). Lower rates of profit and loss sharing paid to depositors are associated with lower levels of deposits. Thus, in spite of the option to pass through the costs, Islamic banks are constrained by the market and forced to continuously pay competitive rates of profit and loss sharing to depositors (Hutapea and Kasri, 2010). Islamic banks are, thus, remain exposed to higher uncertainty costs, and as a consequence, the level of net margin in Islamic banking may not be as low as it is expected.

3. Data and Methodology

In line with the previous works employing the model by Ho and Saunders (1981), and more particularly with the study by Maudos and Solís (2009), this paper uses a regression equation of the type

$$Y_{i,t} = \beta_0 Y_{i,t-1} + \beta_1 I_i + \sum_{j=1}^{J} \beta^j S_{i,t}^j + \sum_{k=1}^{K} \beta^k B_{i,t}^k + \sum_{l=1}^{L} \beta^l M_t^k + \sum_{q=1}^{Q} \beta^q D_t^q + \varepsilon_{i,t} \quad (1)$$

where Y denotes the dependent variable and I denotes the key independent variable of interest. The alphabet S denotes a vector of bank-

specific control variables that are formally seen as pure-spread determinants, B denotes a vector of bank-specific control variables that are not formally seen as pure-spread determinants, M denotes a vector of macroeconomic control variables, D denotes a vector of dummy control variables and ε denotes the error term. Subscripts i and t refer correspondingly to bank i at time t, while superscripts j, k, l and q refer respectively to variables j-th, k-th, l-th and q-th in each of the aforementioned vectors.

The dependent variable in equation (1) refers to net profit margin in Islamic banking or net interest margin in conventional banking. The net profit margin was calculated as the ratio to average productive assets of the difference between income obtained from financing activities and the profit shared to deposit holders. Similarly, net interest margin was calculated as the ratio to average productive assets of the difference between interest income and interest expense.

The key independent variable of interest is a dummy variable for Islamic banks. This dummy is valued 1 if a bank is an Islamic bank and 0 otherwise. The vector of bank-specific control variables that are formally seen as pure spread determinants comprises the degree of risk aversion, average operating costs, transaction size, credit risk, and non-interest income. The degree of risk aversion was proxied using the ratio of equity to total assets. Bank average operating costs were proxied using the ratio to total assets of operating expenses. These expenses included interest expenses as well as non-interest expenses such as personnel, administrative and other operating expenses. Transaction size is proxied using the logarithm of the loans or financing amount granted. Credit risk was proxied using the ratio of loan loss provisions over loans. Non-interest income was calculated as the ratio of non-interest income to total operating income.

Besides, the vector of bank-specific control variables that are formally seen as pure spread determinants includes the Lerner index of market power. This index, whose values range from 0 (perfect competition) to 1 (monopoly), represents each bank's capacity to set prices, P_i, above its marginal cost, MC_i.The index takes the formula of the form, $Lerner_I = \frac{P_i - MC_i}{P_i}$ (De Guevara, Maudos and Pérez, 2005).

The vector of bank-specific control variables that are not formally seen as pure spread determinants consists of implicit interest payments, opportunity cost of holding reserves, a proxy for management quality and a proxy for financing specialization. Implicit interest payment was calculated as the difference between operating expenses and non-interest income in terms of total assets. The opportunity cost of holding reserves was calculated as the ratio to total assets of cash assets. The proxy for management quality is the cost to gross income ratio, while the proxy for financing specialization is the ratio to total assets of the loans or financing.

The vector of macroeconomic control variables consists of real gross domestic product (GDP) growth and inflation. Real GDP growth refers to the percentage change of the annual real GDP, while inflation refers to the percentage change of the annual consumer price index (CPI).

The vector of dummy control variables consists of a dummy for banks owned by domestic private entities, a dummy for banks owned by the central government, and a dummy for foreign banks. Banks owned by provincial governments were treated as the base, particularly due to their collinearity with bank-specific variables. Besides, the vector of dummy control variables included two other dummies, i.e. a dummy for the 2008 global financial crisis and another dummy for the post-2008 global financial crisis.

Table 1: Description of variables

Variables	Description
DEPENDENT VARIABLES	
Net profit margin	Ratio to average productive assets of the difference between income from financing activities and profit shared to deposit holders (NM)
Net interest margin	Ratio to average productive assets of the difference between interest income and interest expense (NM)
KEY VARIABLE OF INTEREST	
D. Islamic banks	1 if a bank is an Islamic bank; 0 otherwise (DISL)
CONTROL VARIABLES	
Pure spread determinants	
Degree of risk aversion	Ratio of equity to total assets (EQTA)
Average operating costs	Ratio to total assets of operating expenses (OETA)
Transaction size	Logarithm of the loans or financing amount granted (LFIN)
Loan loss provisions	Ratio of loan loss provisions over loans (LLP)
Non-interest income	Ratio of non-interest income to total operating income (NNII)
Market power	Difference between revenues and costs divided by revenues (MPI)
Other bank-specific variables	
Implicit interest payments	Differences between operating expenses and non-interest income in terms of total assets (IIP)
Opport. cost of holding reserves	Ratio to total assets of liquid reserves (i.e. cash assets) (OCHR)
Management quality	Cost-to-gross-income ratio (MANQ)
Financing specialization	Ratio to total assets of loans or financing (FSPE)
Macroeconomic variables	
Real GDP growth	Percentage change of real gross domestic product (GGDP)
Inflation	Percentage change of consumer price index (INFL)
Dummy variables	
D. central-govern't-owned bank	1 if a bank is owned by central government; 0 otherwise (DGO)
D. domestic private-owned bank	1 if a bank is owned by domestic private entity; 0 otherwise (DDP)
D. foreign bank	1 if a bank is subsidiary of a foreign entity; 0 otherwise (DFO)
D. 2008 global financial crisis	1 if a year is 2008; 0 otherwise (DGFC)
D. post-2008 global fin. Crisis	1 if a year is later than 2008; 0 otherwise (DPFC)

Data for bank-specific control variables were taken from each bank's published end of year financial reports. In cases where such reports were not available for a particular year, comparable data provided by the Indonesian banking services authority were used. Meanwhile, the rest of the data were obtained from Statistics Indonesia.

The full panel dataset was unbalanced. It extended over 15 years, from 2004 to 2018, and consisted of 12 Islamic and 97 conventional banks. The banks included in the sample were banks that remained to exist until 2018, experienced no recent merger or recent conversion from conventional to Islamic, and had at least three years of observations.

Different from macroeconomic control variables and dummies that are strictly exogenous, bank-specific control variables are assumed to be weakly exogenous to the net margin. Their past and current values are uncorrelated with the error terms, but their future values are. Including these variables and a lag of the dependent variable on the right-hand side of the equation (1) may cause fixed effect estimators inconsistent (Nickell, 1981). To avoid such problem, the system generalized method of moments (GMM) estimators (Arellano and Bover, 1995; Blundell and Bond, 2000) were used. These estimators apply variables in lagged levels as instruments for differenced equations and variables in lagged differences as instruments for level equations.

The use of the system GMM estimators is only justified if the instruments are not correlated with the residuals and there is no second-order serial correlation in the error terms. To check these assumptions, Hansen tests of overidentification and Arellano-Bond tests for zero autocorrelation were conducted. Non-rejections of the null hypothesis in these tests implied that the assumptions were met.

4. Empirical Results

Table 2 presents the descriptive statistics. The average level of net margin in Islamic is higher than that in conventional banking. The level of net margin in Islamic banking is also more dispersed, in that it has a broader range and a larger standard deviation than the level of net margin in conventional banking. Figure 1 visually shows the distribution of net margin values and indicates the existence of outliers.

Table 3 summarizes the correlation matrix. For the sake of brevity, only the correlation coefficients between the main variables are reported. In general, the coefficients are relatively low, relieving the concerns about multicollinearity.

4.1. Basic Regression Results

Table 4 provides the basic regression results. Regressions 1-4 refer to the original bank dealership model by Ho and Saunders (1981). Regression 1 includes a constant, a lag of the dependent variable, an Islamic bank dummy and five bank-specific control variables that are formally seen as pure-spread determinants. Regression 2 adds three dummies for bank ownership types. In regression 3, two macroeconomic variables and two dummies related to the 2008 global financial crisis replace the three ownership dummies. In regression 4, all of the aforementioned variables are included. To keep the number of instruments below the number of panels (Roodman, 2009), the lag's ranges in these regressions are set to between 1 and 12.

The results indicate that all required assumptions in regressions 1-4 are met. Both Hansen tests of overidentification and Arellano-Bond tests for zero autocorrelation fail to reject the null hypotheses of the over-identifying restrictions and of the absence of the second-order serial autocorrelation in the error terms. The results also indicate that some of the bank-specific control variables that are formally seen as pure spread determinants have a significant effect on net margin. This is in line with the previous findings that average operating costs (Maudos and Fernández de Guevara, 2004; Maudos and Solís, 2009; Entrop *et al.*, 2015), non-interest income (Maudos and Solís, 2009; Entrop *et al.*, 2015) and market power (Maudos and Fernández de Guevara, 2004; Maudos and Solís, 2009; Trinugroho, Agusman and Tarazi, 2014) matter for net margin.

Table 2: Descriptive statistics

	Total sample				Islamic banks				Conventional banks			
	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.	Min.	Max.
NM	6.340	3.165	0.240	35.960	7.101	5.462	2.220	35.960	6.281	2.905	0.240	21.840
EQTA	0.146	0.115	-0.033	2.312	0.141	0.115	0.032	0.801	0.147	0.115	-0.033	2.312
OETA	0.094	0.054	0.017	0.961	0.108	0.065	0.030	0.489	0.093	0.053	0.017	0.961
LFIN	15.255	1.964	7.114	20.506	15.567	1.330	11.188	18.028	15.231	2.003	7.114	20.506
LLP	1.793	2.179	0.000	33.780	2.702	3.909	0.460	29.950	1.722	1.967	0.000	33.780
NII	0.140	0.165	0.002	0.952	0.131	0.130	0.002	0.765	0.141	0.168	0.003	0.952
MPI	-0.829	0.833	-7.981	0.568	-0.963	0.827	-4.692	0.471	-0.819	0.833	-7.981	0.568
IIP	0.075	0.037	-0.078	0.378	0.088	0.050	-0.078	0.324	0.074	0.035	-0.073	0.378
OCHR	0.018	0.019	0.000	0.134	0.010	0.008	0.000	0.035	0.019	0.020	0.000	0.134
MANQ	2.756	1.961	0.462	63.993	2.418	0.798	0.525	6.296	2.783	2.022	0.462	63.993
FSPE	0.603	0.152	0.002	1.063	0.708	0.103	0.109	0.900	0.594	0.152	0.002	1.063
GGDP	5.476	0.536	4.630	6.350	5.380	0.487	4.630	6.350	5.484	0.539	4.630	6.350
INFL	6.228	3.647	2.780	17.110	5.441	3.037	2.780	17.110	6.289	3.684	2.780	17.110

Source: Author Estimation

Table 3: Correlation matrix

	NM	EQTA	OETA	LFIN	LLP	NII	MPI	IIP	OCHR	MANQ	FSPE	GGDP	INFL
NM	1.000												
EQTA	0.103	1.000											
OETA	0.141	-0.060	1.000										
LFIN	-0.151	-0.320	-0.047	1.000									
LLP	0.017	0.039	0.184	0.100	1.000								
NII	-0.322	-0.084	0.338	0.245	0.074	1.000							
MPI	0.305	0.035	-0.186	0.223	-0.079	0.354	1.000						
IIP	0.397	0.026	0.448	-0.225	0.200	-0.500	-0.564	1.000					
OCHR	0.540	-0.112	-0.029	-0.039	-0.014	-0.292	0.214	0.177	1.000				
MANQ	-0.117	-0.065	-0.205	-0.011	-0.009	-0.134	-0.031	-0.136	-0.075	1.000			
FSPE	0.043	-0.048	0.030	0.349	0.078	-0.173	-0.068	0.224	-0.081	0.001	1.000		
GGDP	0.055	-0.043	-0.081	-0.141	-0.021	-0.035	0.066	-0.063	0.085	0.079	-0.093	1.000	
INFL	0.125	-0.070	-0.080	-0.232	0.015	-0.124	0.037	0.007	0.106	0.055	-0.116	0.338	1.000

Source: Author Estimation

Table 4: Basic regression results

	System GMM Estimators							
	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8
L.NM	0.488***	0.478***	0.503***	0.502***	0.410***	0.416***	0.413***	0.426***
	(0.082)	(0.076)	(0.082)	(0.074)	(0.058)	(0.061)	(0.061)	(0.064)
DISL	0.485	0.691	0.480	0.603	0.722*	0.786*	0.678*	0.713*
	(0.391)	(0.417)	(0.387)	(0.379)	(0.419)	(0.447)	(0.407)	(0.411)
EQTA	-0.280	-0.485	-0.195	-0.346	-0.592	-0.702	-0.405	-0.579
	(1.229)	(1.209)	(1.130)	(1.080)	(1.139)	(1.067)	(0.934)	(0.860)
OETA	7.622***	7.836***	7.033***	7.222***	1.182	1.377*	0.848	1.069
	(2.680)	(2.779)	(2.476)	(2.531)	(0.772)	(0.750)	(0.742)	(0.714)
LFIN	-0.276**	-0.315***	-0.204	-0.223*	-0.423***	-0.393***	-0.331**	-0.310**
	(0.107)	(0.108)	(0.123)	(0.120)	(0.142)	(0.146)	(0.139)	(0.133)
LLP	-0.014	-0.016	-0.019	-0.022	-0.095	-0.097	-0.102	-0.106
	(0.067)	(0.068)	(0.065)	(0.066)	(0.074)	(0.075)	(0.069)	(0.069)
NNII	-5.423***	-4.784***	-5.202***	-4.554***	-2.160***	-2.083***	-2.134***	-2.070***
	(0.704)	(0.744)	(0.704)	(0.750)	(0.714)	(0.763)	(0.669)	(0.719)
MPI	1.197***	1.216***	1.184***	1.210***	1.365***	1.401***	1.309***	1.355***
	(0.168)	(0.168)	(0.171)	(0.172)	(0.202)	(0.201)	(0.192)	(0.197)
IIP					21.729***	22.136***	20.360***	21.009***
					(3.485)	(3.346)	(3.819)	(3.699)
OCHR					23.433***	27.866***	26.518***	32.144***
					(8.658)	(8.968)	(8.679)	(8.548)
MANQ					-0.021	-0.017	-0.015	-0.012
					(0.023)	(0.021)	(0.017)	(0.016)
FSPE					1.265*	0.993	1.275*	1.039*
					(0.702)	(0.690)	(0.656)	(0.626)
GGDP			-0.150*	-0.156**			-0.110	-0.123*
			(0.076)	(0.075)			(0.070)	(0.073)
INFL			-0.007	-0.006			-0.014	-0.015
			(0.016)	(0.016)			(0.013)	(0.013)
Ds. own		Yes		Yes		Yes		Yes
Ds. crisis			Yes	Yes			Yes	Yes
N obs	1,494	1,494	1,494	1,494	1,494	1,494	1,494	1,494
N banks	109	109	109	109	109	109	109	109
N inst	93	96	97	100	90	93	94	97
2nd order test	0.611	0.577	0.582	0.552	0.896	0.856	0.805	0.740
Hansen test	0.157	0.164	0.151	0.162	0.123	0.103	0.188	0.164

Note: Each regression includes a constant. The lag's ranges in regressions 1-4 are set to between 1 and 12, while in regressions 5-8 are set to between 1 and 7. The values in parentheses are heteroscedasticity robust standard errors clustered at bank level. The values reported for 2nd order test and Hansen test refer to the prob. > z and prob. > chi2 respectively. The asterisk *, ** and *** denote significance at the 10, 5 or 1 percent level.

More importantly, with respect to the focus in this paper, it can be seen that the effect of Islamic bank dummy in regressions 1-4 is always positive, but not statistically significant. There is here no evidence indicating the presence of a statistical difference between the level of net margin in Islamic and conventional banking.

Regressions 5-8 refer to the extended bank dealership model. Regression 5 includes a constant, a lag of the dependent variable, an Islamic bank dummy, bank-specific control variables that are formally seen as pure-spread determinants as well as variables that are not formally seen as pure spread determinants. Regression 6 adds three dummies for bank ownership types. In regression 7, two macroeconomic variables and two dummies related to the 2008 global financial crisis are included instead of ownership dummies. Regression 8 includes all of the variables just mentioned. To prevent the proliferation of the number of instruments, the lag's ranges are set to between 1 and 7.

The results indicate that all required assumptions in regressions 5-8 are met. There is no correlation between the instruments and the residuals. Additionally, there is no second-order serial correlation in the error terms. In line with the findings in previous literature, the results also indicate that implicit interest payments (Maudos and Solís, 2009; Poghosyan, 2010; Lee and Isa, 2017) and opportunity cost of holding reserves (Zhou and Wong, 2008; Islam and Nishiyama, 2016) have a significant effect on net margin.

The coefficient of the dummy for Islamic banks is positive and statistically significant in regressions 5-8 albeit only at the 10 percent level. There is here some weak evidence that the level of net margin is higher in Islamic than in conventional banking.

4.2. Further Results

Regressions in Table 4 include 109 banks of which asset size varies quite widely. The fact that no Islamic bank belongs to the top 10 largest banks may raise a concern that the results in Table 4 are biased. To check if the presence of the top 10 largest conventional banks in the sample biases the results, regressions in Table 4 are repeated while excluding those 10 banks.

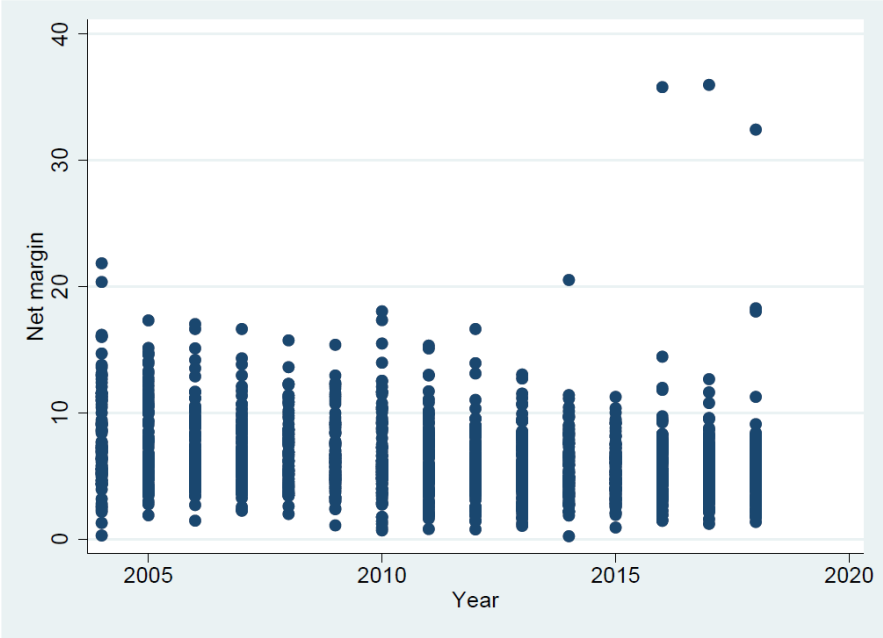
Table 5: Results with the sample excluding ten largest banks

	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8
L.NM	0.480***	0.477***	0.492***	0.493***	0.409***	0.413***	0.419***	0.427***
	(0.084)	(0.076)	(0.085)	(0.077)	(0.059)	(0.062)	(0.063)	(0.067)
DISL	0.535	0.717	0.510	0.653	0.873*	0.899*	0.786*	0.792*
	(0.409)	(0.440)	(0.393)	(0.399)	(0.461)	(0.489)	(0.419)	(0.449)
EQTA	-0.333	-0.517	-0.368	-0.468	-0.552	-0.713	-0.586	-0.699
	(1.202)	(1.158)	(1.131)	(1.070)	(1.158)	(1.083)	(0.996)	(0.933)
OETA	7.890***	7.940***	7.496***	7.455***	1.275	1.403*	0.959	1.114
	(2.814)	(2.781)	(2.709)	(2.636)	(0.791)	(0.780)	(0.767)	(0.742)
LFIN	-0.297***	-0.312***	-0.291**	-0.274**	-0.467***	-0.414**	-0.430**	-0.343**
	(0.112)	(0.113)	(0.141)	(0.135)	(0.158)	(0.158)	(0.164)	(0.144)
LLP	-0.019	-0.017	-0.025	-0.024	-0.097	-0.096	-0.102	-0.102
	(0.069)	(0.069)	(0.066)	(0.068)	(0.077)	(0.075)	(0.072)	(0.072)
NNII	-5.554***	-4.920***	-5.409***	-4.747***	-2.138***	-2.156**	-2.043***	-2.100***
	(0.783)	(0.799)	(0.810)	(0.819)	(0.799)	(0.830)	(0.746)	(0.766)
MPI	1.170***	1.201***	1.164***	1.198***	1.344***	1.379***	1.307***	1.352***
	(0.165)	(0.168)	(0.168)	(0.171)	(0.197)	(0.202)	(0.194)	(0.205)
IIP					21.758***	21.881***	20.760***	20.830***
					(3.494)	(3.392)	(3.796)	(3.753)
OCHR					23.262***	28.225***	24.431***	31.528***
					(9.209)	(8.923)	(9.472)	(8.829)
MANQ					-0.017	-0.016	-0.012	-0.011
					(0.020)	(0.020)	(0.016)	(0.016)
FSPE					1.374**	1.011	1.472**	1.045
					(0.680)	(0.647)	(0.648)	(0.630)
GGDP			-0.159*	-0.166*			-0.129	-0.133
			(0.085)	(0.084)			(0.082)	(0.084)
INFL			-0.005	-0.004			-0.014	-0.013
			(0.017)	(0.017)			(0.014)	(0.014)
Ds. own		Yes		Yes		Yes		Yes
Ds. crisis			Yes	Yes			Yes	Yes
N obs	1,363	1,363	1,363	1,363	1,363	1,363	1,363	1,363
N banks	99	99	99	99	99	99	99	99
N inst	86	88	90	92	90	92	94	96
2nd ord test	0.605	0.571	0.585	0.552	0.882	0.854	0.820	0.764
Hansen test	0.156	0.165	0.139	0.135	0.182	0.189	0.254	0.238

Note: Each regression includes a constant. The lag's ranges in regressions 1-4 are set to between 1 and 11, while in regressions 5-8 are set to between 1 and 7. The values in parentheses are heteroscedasticity robust standard errors clustered at bank level. The values reported for 2nd order test and Hansen test refer to the prob. > z and prob. > chi2 respectively. The asterisk *, ** and *** denote significance at the 10, 5 or 1 percent level.

The results are reported in Table 5. From regression 1 to regression 8, the coefficient of the dummy for Islamic banks is always positive. It is not statistically significant in regressions 1-4, but significant at the 10 percent level in regressions 5-8.

Figure 1: Net margin over the period of analysis



Source: Authors' computation

The scatter plot in Figure 1 visually shows the existence of upper outliers in the value of net margin. This may affect the estimates of regression parameters. To ensure that the conclusions in this paper are not driven by outliers, another robustness test was conducted by excluding observations that were above the 99th percentiles. The number of observations is now reduced to 1,347 and the number of panels is reduced to 98 (an Islamic bank is dropped due to missing values).

Table 6 presents the results. From regression 1 to regression 8, the coefficient of the dummy for Islamic banks stays positive, but not statistically significant. Excluding outliers does weaken the relationship between Islamic bank dummy and net margin.

Table 6: Results with the sample excluding ten largest banks and outliers

	System GMM Estimators							
	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8
L.NM	0.469***	0.480***	0.485***	0.495***	0.436***	0.419***	0.449***	0.433***
	(0.070)	(0.056)	(0.071)	(0.056)	(0.053)	(0.057)	(0.054)	(0.058)
DISL	0.225	0.377	0.188	0.325	0.295	0.462	0.251	0.405
	(0.260)	(0.268)	(0.261)	(0.249)	(0.287)	(0.315)	(0.267)	(0.298)
EQTA	0.037	-0.126	-0.007	-0.064	-0.141	-0.199	-0.188	-0.243
	(0.467)	(0.434)	(0.451)	(0.420)	(0.486)	(0.478)	(0.454)	(0.428)
OETA	7.476***	7.539***	7.073***	7.085***	1.702**	1.754**	1.466*	1.574*
	(2.629)	(2.648)	(2.486)	(2.511)	(0.851)	(0.850)	(0.812)	(0.795)
LFIN	-0.338***	-0.345***	-0.325***	-0.300***	-0.488***	-0.511***	-0.507***	-0.498***
	(0.088)	(0.078)	(0.099)	(0.092)	(0.095)	(0.103)	(0.125)	(0.123)
LLP	0.009	0.012	0.002	0.005	-0.065	-0.058	-0.067	-0.062
	(0.055)	(0.056)	(0.053)	(0.054)	(0.065)	(0.066)	(0.067)	(0.067)
NNII	-4.787***	-4.137***	-4.607***	-3.919***	-1.723***	-1.457**	-1.689***	-1.414**
	(0.705)	(0.683)	(0.700)	(0.681)	(0.595)	(0.687)	(0.625)	(0.662)
MPI	1.093***	1.134***	1.094***	1.136***	1.277***	1.286***	1.263***	1.275***
	(0.136)	(0.135)	(0.137)	(0.139)	(0.175)	(0.172)	(0.176)	(0.173)
IIP					18.579***	18.669***	17.894***	17.823***
					(4.187)	(4.220)	(4.482)	(4.507)
OCHR					16.377*	14.340*	14.548*	14.696*
					(9.079)	(8.193)	(7.987)	(7.746)
MANQ					-0.021	-0.021	-0.017	-0.016
					(0.021)	(0.022)	(0.019)	(0.018)
FSPE					1.727***	1.627***	1.962***	1.711***
					(0.544)	(0.511)	(0.577)	(0.545)
GGDP			-0.145*	-0.145*			-0.113	-0.113
			(0.083)	(0.081)			(0.081)	(0.084)
INFL			-0.001	-0.000			-0.011	-0.009
			(0.012)	(0.012)			(0.011)	(0.011)
Ds. own		Yes		Yes		Yes		Yes
Ds. crisis			Yes	Yes			Yes	Yes
N obs	1,347	1,347	1,347	1,347	1,347	1,347	1,347	1,347
N banks	98	98	98	98	98	98	98	98
N inst	86	88	90	92	90	92	94	96
2nd ord test	0.194	0.179	0.167	0.154	0.488	0.427	0.469	0.415
Hansen test	0.191	0.205	0.167	0.184	0.263	0.222	0.280	0.249

Note: Each regression includes a constant. The lag's ranges in regressions 1-4 are set to between 1 and 11, while in regressions 5-8 are set to between 1 and 7. The values in parentheses are heteroscedasticity robust standard errors clustered at bank level. The values reported for 2nd order test and Hansen test refer to the prob. > z and prob. > chi2 respectively. The asterisk *, ** and *** denote significance at the 10, 5 or 1 percent level.

Table 7: Results with the sample excluding ten largest banks, outliers, and insignificant bank specific variables

	System GMM Estimators							
	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8
L.NM	0.455***	0.480***	0.478***	0.500***	0.438***	0.423***	0.448***	0.433***
	(0.055)	(0.047)	(0.058)	(0.048)	(0.045)	(0.048)	(0.046)	(0.048)
DISL	0.214	0.356	0.222	0.308	0.205	0.291	0.191	0.331
	(0.287)	(0.268)	(0.276)	(0.249)	(0.268)	(0.307)	(0.259)	(0.276)
OETA	7.352***	7.449***	6.894***	7.057***	2.341**	2.425**	1.963*	2.105**
	(2.558)	(2.462)	(2.408)	(2.373)	(1.091)	(1.125)	(1.010)	(1.015)
LFIN	-0.379***	-0.353***	-0.378***	-0.331***	-0.502***	-0.516***	-0.511***	-0.494***
	(0.076)	(0.072)	(0.098)	(0.094)	(0.094)	(0.102)	(0.131)	(0.132)
NNII	-4.255***	-3.697***	-4.144***	-3.601***	-1.989***	-1.709**	-1.850**	-1.506**
	(0.793)	(0.793)	(0.755)	(0.780)	(0.723)	(0.741)	(0.714)	(0.718)
MPI	1.045***	1.105***	1.054***	1.121***	1.274***	1.285***	1.242***	1.255***
	(0.140)	(0.136)	(0.136)	(0.138)	(0.176)	(0.174)	(0.185)	(0.184)
IIP					16.511***	16.266***	15.371***	15.037***
					(5.309)	(5.247)	(5.419)	(5.258)
OCHR					16.377**	15.205***	14.574**	14.547**
					(6.871)	(5.765)	(7.049)	(5.990)
FSPE					1.621***	1.420***	1.714***	1.361***
					(0.559)	(0.561)	(0.576)	(0.550)
GGDP			-0.170**	-0.168**			-0.121	-0.123
			(0.079)	(0.073)			(0.078)	(0.076)
INFL			-0.003	-0.002			-0.005	-0.003
			(0.011)	(0.012)			(0.010)	(0.010)
Ds. own		Yes		Yes		Yes		Yes
Ds. crisis			Yes	Yes			Yes	Yes
N obs	1,347	1,347	1,347	1,347	1,347	1,347	1,347	1,347
N banks	98	98	98	98	98	98	98	98
N inst	80	82	84	86	82	84	86	88
2nd order test	0.184	0.179	0.160	0.154	0.439	0.383	0.393	0.330
Hansen test	0.109	0.108	0.149	0.149	0.140	0.127	0.129	0.128

Note: Each regression includes a constant. The lag's ranges in regressions 1-4 are set to between 1 and 15, while in regressions 5-8 are set to between 1 and 9. The values in parentheses are heteroscedasticity robust standard errors clustered at bank level. The values reported for 2nd order test and Hansen test refer to the prob. > z and prob. > chi2 respectively. The asterisk *, ** and *** denote significance at the 10, 5 or 1 percent level.

Regressions in the previous Tables include many independent variables. This may reduce efficiency, particularly when the independent variables included are not relevant to the net margin. To avoid the problem, a final robustness test is conducted by excluding bank-specific control variables whose coefficient turns out to be insignificant in previous regressions.

The results in Table 7 show that the regression model is in general robust. Excluding degree of risk aversion, loan loss provisions, and management quality leads to no substantive change from the results in Table 6. The coefficients of bank specific variables are, in most regressions, significant. By contrast, none of the coefficient of Islamic bank dummy that turns out to be significant.

5. Conclusion

This paper benchmarks the level of net margin in Islamic and conventional banking. Despite the theoretical suggestion that a difference may exist, the results provide no evidence that the level of net margin in Islamic banking differs from that in conventional banking. The difference between net margin in Islamic and conventional banking is at best not robust and subject to the choice of control variables and the composition of the sample. Most importantly, the difference vanishes once the outliers are removed.

Three implications may be derived from these findings. First, these findings dismiss the anecdotal belief that Islamic banking is more costly. Undefined stream of income from profit and loss sharing instruments does not necessarily increase net margin in Islamic banking. There is, thus, no reason to see the spread of Islamic banking as a source of inefficiency in the financial sector. Second, the above findings lend no support to the claim that profit and loss sharing contracts in Islamic banking bring about lower intermediation costs. The fact that Islamic banks has an option to pass through the costs to depositors cannot relieve them from the uncertainty cost pressure. They bear relatively similar cost pressure to conventional banks. Third, those considering Islamic banking should not take the things for granted. More studies are needed to understand the nature of and driving forces behind net margin in this banking system. For example, the results from control variables in this paper indicate that transaction size has a significant effect on net margin.

In contrast to the loans amount granted by conventional banks, the amount of financing granted by Islamic banks remains very small. Thus, policies aimed to increase transaction size in Islamic banking may help reducing intermediation costs in this banking system.

Finally, the results in this paper, which are based on Indonesian data, hint that explaining the overall pattern of net margin in Islamic banking may not be enough. There are observations beyond the general pattern that other observations follow. It is therefore also necessary to elucidate the persistence of outliers and explain why.

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