

# The Supply Chain Management of Islamic and Conventional Banks; Evidence from Indonesian Case

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**Abstract**— The present study aims to examine the idea of supply chain management in the financial institutions like banks in the region of Indonesia. After the detailed examination of existing literature current research work has developed a model for the supply chain in financial perspective with its physical implication as well. This study use panel or pooled data taken from annual report of Islamic and conventional banks in Indonesia during 2012-2017 period and consist of 10 Islamic and 24 conventional banks. Pooled regression is used to estimate the effect of bank-specific such as profitability, growth, tangibility, earning volatility and size on supply chain management. The finding of this study shows that profitability and growth have positive and significant effect on supply chain management, while size and tangible asset have negative impact on it of conventional banks. Earning volatility does not have any influence on supply chain management both for Islamic and conventional banks. In general, there is no significant explanatory variables which have significant influence on supply chain management of Islamic banks except growth variable which have marginal impact on supply chain management decision. In the future, this research can be developed by using different measure of earning volatility.

**Keywords**— Supply chain management, Supply Chain Management, Islamic banks, Conventional Banks

## 1. Introduction

Islamic and conventional banks have the same function as intermediary institutions channeling funds from parties who have excess funds to those who lack funds. However, both banks use different modes in delivering their funds. Conventional banks used interest as a basis in providing credit to their customers. Since the interest is determined in advance, conventional banks are relatively easy to determine profit they will earn, namely spread or the different between deposit and credit interest [1-5].

Conversely, Islamic banks does not charge nor provide any interest to their customers. Instead, Islamic banks use profit and loss sharing mode of

finance in channeling their funds, particularly murabahah and musharakah contracts [6]. Based on this profit and loss sharing principles, their profit depends on the profit of their customers and hence, Islamic banks cannot estimate properly their profit as conventional banks. Therefore, Islamic bank are more risky that their counterpart. This condition will influence on their supply chain management decision. Supply chain management is a ratio between liabilities and equity capital. The higher the liability the higher fixed burden of the banks and then the riskier. Since every source of capital have different cost of capital, banks should determine ideal supply chain management. Ideal supply chain management is the ratio of debt and equity that can minimize cost of capital which in turn improve firm's value.

The debt irrelevance proposition of [7] suggest that in perfect market (i.e no asymmetric information, no transaction cost, no taxes, no bankruptcy cost, and no agency cost), no ideal supply chain management. In other word, the choice of source of capital does not have any impact on firm's value. Thus, in perfect market, the different types of capital is not relevant. In reality, however, firms have to bear tax and hence supply chain management choice is relevant because of the fact that interest is a tax deductible expense and generates a valuable tax shield [8]. Until recently, topic concerning supply chain management is still attractive for academicians to investigate. Current research on supply chain management are many, for instance, [9-12].

Although there are a lot of researches on supply chain management, investigating supply chain management of Islamic bank is still attractive because the present of Islamic banks is quite new. Since Islamic bank is relatively new business entity which have different operation basis than that of conventional bank, this study interested in comparing the supply chain management decision of both Islamic and conventional banks particularly in Indonesia.

The rest of the paper is organized as follows: Section 2 describes the literature review and hypothesis development. Section 3 presents data, variables, and research methodology. Section 4 presents empirical results and discussion. Finally,

conclusions and avenues for future research are presented in Section 5.

## 2. Literature Review and Hypothesis Development

A large body of theoretical literature on how firms arrange their supply chain management has been developed by some researchers. For example [13] is the first authors who proposed irrelevant theory of supply chain management. Their proposition is based on the perfect market which assume that there is no asymmetric information, no transaction cost, no taxes, no bankruptcy cost, and no agency cost. However when they introduced taxes in their model [14], the choice of capital from different source has different cost of capital.

Studies on supply chain management have been conducted by some researchers. In [15] examine the determinant of supply chain management of Small and MEdum size enterprises in Portugal. Their finding show that profitability, asset structure, firm's size, and growth are reliable determinant of supply chain management.

**Profitability and Supply chain management**

The effect of profitability on supply chain management is controversial both theoretically and empirically [16]. Pecking order theory suggest that profitable firms prefer to look for external source of capital than internal. Based on this theory, the higher the profit of the firm the less proportion of the debt relative to the equity.

Conversely, signaling theory suggest to use more debt for profitable firms because it can give good signal to market that the firm have bright future. So the prospective companies will not issue additional share because it will dilute existing share value. Static Trade-off hypothesis also suggest that there is positive relationship between profitable firms and their debt [17]. In other word, more profitable firms and have plenty of taxable income are likely to have higher leverage. However, unprofitable firms with risky intangible asset tend to rely primarily on equity financing [18].

Several empirical researches indicate a negative relationship between profitability and leverage. For instance, [19-23] found negative relationship between profitability and leverage ratio. Some other empirical research on commercial banks have found mixed result between profitability and leverage. In [24], for example, shows that profitability has negative impact on total debt ratio and short-term debt ratio whereas it has positive relationship with long-term debt ratio. Since there are contradictive theories and empirical research of supply chain management, this study proposed hypothesis as follow:

H1: profitability have relationship with supply

chain management.

**Firm's Growth and Supply chain management**

Firm's growth is an important determinant in arranging supply chain management. Research conducted by [25] have shown that firm's growth is a reliable determinant in explaining supply chain management decision. Strong evident relationship between growth and supply chain management has been indicated by some researchers. Using structural equation modeling approach, [26] found that firm's growth is the most important determinant of supply chain management choice.

Adverse relationship between growth opportunity and supply chain management has been observed by some researchers. Using market-to-book ratio as a measure of growth opportunity, [27] found that firm's growth negatively related to supply chain management decision. Similarly, using the same measure of growth opportunity, [28] shown negative relationship between market-to-book and leverage ratio. Evidence from cross country is shown by [4]who found that growth opportunity is negatively related to supply chain management.

Contradictive result is evidenced by some studies. For instance, [7] found that growth have positive impact on supply chain management, however the relationship is statistically insignificant. Furthermore, his study shown that growth has positive association with short term debt ratio whereas it has negative relationship with long term debt ratio. Based on the discussion above, this study propose hypothesis below:

H2: firm's growth has negative effect on supply chain management.

**Tangibility and Supply chain management**

Pecking order and trade-off theory has contradictive explanation concerning the relationship between tangibility variable and supply chain management. The pecking order theory suggests that the firm with plenty tangible asset tend to have asymmetric information and thereby prefer to use more equity than debt. In contrast, the trade-off theory suggests that firms with more tangible assets are likely to have higher leverage than that of risky intangible assets because tangible assets serve as collateral and retain more value in liquidation process. Thus, according to this theory, there is positive relationship between tangibility and debt ratio. Consequently, the firms with less tangible asset and hence unable to provide enough collaterals will have to pay higher interest. Based on the discussion above, the below hypothesis is proposed.

H3. Tangibility has positive effect on supply chain management.

**Earning Volatility and Supply chain management**

Higher volatility of earnings increases the probability of financial distress. Next, higher financial risk will increase cost of debt. Consequently, firms with higher

earnings volatility will face the difficulties in debt financing and may increase the probability of financial distress. Trade-off theory suggest that higher debt firms or firms with high possibility to fail should not be highly leveraged. Therefore, financial distress play a significant role in choosing supply chain management. Furthermore, trade-off theory predict that there is negative association between earning volatility and debt ratio [17].

H4. Earning volatility has a negative effect on supply chain management

**Size and Supply chain management**

The size of company may influence it capability to access external source of capital. Large and bona fide companies are more trusted by creditors than the small one. Likewise, large banks can gather deposit more easily than small banks. Therefore large banks tend to have higher leverage than small banks. Empirical studies regarding the relationship between firm’s size and supply chain management show different results. For example, study conducted by [7]in Ghana indicate that total debt and short term debt have positive and significant impact on supply chain management, but long term debt has a negative influence on supply chain management. Other research show negative relationship between firm’s size and supply chain management. For example studies conducted by [7, 17]. Based on the literature discussion above, this research propose below hypothesis.

H5. Size has a positive effect on supply chain management.

**3. DATA AND METHODOLOGY**

This research use banking data listed in Indonesian Stock Exchange either Islamic or conventional banks. Data are collected from annual report of Islamic and conventional banks During 2012 To 2017 Period Which Consist Of 10 Islamic Banks And 24 Conventional Banks.

**Variables and Their Measurements**

This research adopt causal relationship examination which involve dependent and independent variables. The dependent variable is supply chain management

while independent variables consist of profitability, firms’ growth, asset tangibility, and earning volatility. The detail of variable measurement is presented in table 1.

**Table 1.** Measurement of Variables

Variable	Symbol	Measurement
Supply chain management	DER ROA	Total Debt/Total Equity
Profitability Firms’	GROWTH TANG	Earning After Tax/ Total Asset
Growth	EVOL	(Total Asset <sub>t</sub> – Total Asset <sub>t-1</sub> )/Total Asse <sub>t-1</sub>
Tangibility		Log natural of Total Fixed Asset
Earning Volatility		(EBIT <sub>t</sub> – EBIT <sub>t-1</sub> )/EBIT <sub>t-1</sub>

**Analysis Method**

This research combine cross section and time series data or known as panel or pool data. Therefore types of regression used in this research are ordinary least square (OLS), fixed effect and random effect to estimate the influence of profitability, growth, asset tangibility, earning volatility and firms’ size on supply chain management. Below are the model of regression proposed in this research.

$$DER = a + \beta_1 PROF + \beta_2 GROWTH + \beta_3 TANG + \beta_4 EVOL + \beta_5 SIZE + e \dots\dots\dots OLS$$

$$DER = a + \beta_1 PROF + \beta_2 GROWTH + \beta_3 TANG + \beta_4 EVOL + \beta_5 SIZE + e \dots\dots\dots Fixed Effect$$

$$DER = a + \beta_1 PROF + \beta_2 GROWTH + \beta_3 TANG + \beta_4 EVOL + \beta_5 SIZE + e \dots\dots\dots Random Effect$$

**1. EMPIRICAL RESULT AND DISCUSSION**

Table 2 and table 3 present descriptive statistic of conventional and Islamic banks respectively.

**Table 2** Descriptive Statistic of Conventional Banks

	Observations	Mean	Maximum	Minimum	Std. Dev.
DER	144	7.5886	14.7483	2.9918	2.2420
ROA	144	0.0186	0.8732	-0.0771	0.0731
GROWTH	144	0.1168	0.6128	-0.9992	0.1451
TANG	144	0.0599	5.2413	0.0020	0.4354
EVOL	144	0.1305	7.1855	-2.4503	0.8248
SIZE	144	31.9754	34.6577	23.0941	1.6043

**Table 3.** Descriptive Statistic of Islamic Banks

	<b>Observations</b>	<b>Mean</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Std. Dev.</b>
DER	60	3.362968	12.2423	0.0011	2.971933
ROA	60	0.010365	0.1689	-0.1218	0.029137
GROWTH	60	0.167933	1.1011	-0.9989	0.26573
TANG	60	0.016452	0.0473	0.0042	0.010187
EVOL	60	0.311593	9.9892	-6.1066	1.897718
SIZE	60	30.53087	38.7426	27.8745	2.269927

The average of debt to equity ratio are far above 1, indicating that asset owned by banks mostly come from third party. This is the special character of bank institution which collect deposit from their customers. The high leverage of banks is in line with the study reported by Sheikh and Qureshi (2014) and Ahsan et al., (2016). However, conventional banks more leveraged than Islamic banks. This is because some part of Islamic bank deposit is based on profit and loss sharing principles which is recognized as equity capital.

The profitability of conventional banks is 1.68% in average. This percentage is higher than the profitability of Islamic banks which is only 1.03%. This finding is in line with the case of the banking in Pakistan as reported by [17]

The growth of Islamic banks is higher than conventional banks, namely 16.79 compare to 11.68% respectively. The high of Islamic bank growth could be caused by market share of Islamic banks is still low, while the existence of potential market is high. Other factor that may cause high growth of Islamic banks is the awareness of Muslim population toward the present of Islamic bank in their area and the active market penetration conducted by Islamic banks.

The average of earning volatility of Islamic banks is 31.05%, much higher than that of conventional bank which is only 13.0%%. This significant difference indicating that the risk of Islamic banks is higher than the risk of conventional banks. This is the common feature of Islamic banks that channel their financing based on profit and loss sharing scheme. The earning of conventional banks is more

certain and it can be estimated easily in advance because it is based on the certain percentage of credit. Meanwhile, Islamic banks' earnings cannot be determined in advance, particularly the financing based on profit and loss sharing, because it depend on profit obtained the customers financed by Islamic banks.

#### 4. Regression Result

Regression result of conventional banks is presented in table 4 and the result of Islamic banks can be seen in table 5. Using the same regression model, table 5 shows that profitability, tangibility, earning volatility, and size do not have any influence on supply chain management of Islamic banks, while growth variable has positive and significant effect on supply chain management.

In the case of conventional banks as indicated in table 4, profitability, growth, tangibility, and size have significant influence of supply chain management decision. Specifically, based on random effect analysis profitability and growth have positive and significant effect on supply chain management. In contrast, tangibility and size have negative and significant effect on supply chain management. The positive effect of profitability and supply chain management is in line with.....

The result of common effect shows that growth have positive and significant effect on supply chain management both for Islamic and conventional banks. This finding is in contrast with the result study conducted by [17] in banking sector in Oakistan. They found that firms' growth negatively effect on leverage.

**Table 4.** The Influence of Explanatory Variables on Supply chain management of Conventional Banks  
Dependent variable=DER

Variable	Common Effect		Fixed effect		Random Effect	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	14.35413***	3.037128	80.27475***	5.081954	34.92162***	4.440307
PROF	-17.16265	-1.191796	30.80359***	2.692572	30.35656***	2.782693
GROWTH	4.862186***	2.687787	1.853180*	1.673760	2.341729***	2.138399
TANG	3.380179	1.245201	-7.754537***	-3.700808	-5.774353***	-2.861012
EVOL	0.079350	0.356463	-0.027459	-0.208628	0.020774	0.159609
SIZE	-0.226028	-1.537335	-2.283209***	-4.641294	-0.870263***	-3.556073
N		144	144		144	
R <sup>2</sup>		0.0927	0.7787		0.1867	
F-Statistic		2.8195	14.4504		6.3351	
Prob. (F-Statistic)		0.0186	0.0000		0.000025	
Hausman Test $\chi^2$			203.167224			
Prob. $\chi^2$			0.0000			

Notes: \*\*\*significant at 1%, \*\* significant at 5%, \*significant at 10%

**Table 5.** The Influence of Explanatory Variables on Supply chain management of Islamic Banks  
Dependent variable=DER

Variable	Common Effect		Fixed effect		Random Effect	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	-1.138532	-0.215076	3.309026	0.577226	2.988508	0.541822
PROF	-2.932774	-0.214950	-3.622370	-0.472978	-3.671322	-0.480668
GROWTH	2.887292*	1.876721	1.080620	1.070684	1.146222	1.152141
TANG	-58.88498	-1.537562	-42.23811	-1.142253	-44.03697	-1.237686
EVOL	-0.088759	-0.402009	-0.091889	-0.676948	-0.090178	-0.668554
SIZE	0.165191	0.965759	0.020751	0.110656	0.031856	0.180055
N		60	60		60	
R <sup>2</sup>		0.114943	0.788286		0.068050	
F-Statistic		1.402601	11.96791		0.788600	
Prob. (F-Statistic)		0.238083	0.000000		0.562493	
Hausman Test $\chi^2$			85.824906			
Prob. $\chi^2$			0.0000			

Notes: \*\*\*significant at 1%, \*\* significant at 5%, \*significant at 10%

Tangibility have negative and significant effect on leverage for conventional banks either examine with fixed effect or random effect, but it is not significant with common effect examination. The negative influence of tangibility toward supply chain management is contradict to the argument which claim that tangible asset can be used as collateral in looking for debt, so that tangibility should have positive relationship with supply chain management. However, lack of collateral can be overcome by building close relationship between lender and creditor.

Although it was predicted that earning volatility has influence of supply chain management, this study found no significant relationship between them both for conventional and Islamic banks.

In the case of conventional banks, size does not have significant effect when it was examined with common effect. Meanwhile, when it was analyzed using fixed and random effect, firms' size negatively related to supply chain management. This finding is in contrast with the prediction of trade-off theory suggesting that large companies tend to have higher leverage because they have capability to reduce risk by diversification. In addition large banks are perceived to be too big to fail.

## 5. Conclusions

This study examines the determinant of supply chain management on both conventional and Islamic banks in Indonesia. Variables such as profitability, growth, asset tangibility, and size are the significant determinant of supply chain management of conventional banks. Furthermore, profitability and growth have positive and significant effect on supply chain management, while asset tangibility and firms' size have negative effect on supply chain management.

In the case of Islamic banks, only firms' size have positive and significant influence on supply chain management, while profitability, growth, tangibility and size do not have any significant effect on it. Earning volatility does not any significant effect on supply chain management both for conventional and Islamic banks.

Positive sign of growth variable both for conventional and Islamic bank indicate that firm's growth is an important variable in determining supply chain management. Specifically, external source of capital become significant role in developing company or banks.

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