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## **THE ASSOCIATION BETWEEN ISLAMIC MODE OF FINANCING AND INDUSTRIAL PRODUCTION: A CASE FROM PAKISTAN**

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**Abstract:** The purpose of this paper is to investigate the relationship between Islamic banking and industrial production by decomposing Islamic financing (IF) into profit and loss sharing (PLS) and non-profit and loss sharing (non-PLS) modes of financing. The results reveal that IF plays an important role in boosting industrial production in the short runs, as well as in the long run. Moreover, this positive effect mainly comes from non-PLS financing. In contrast, no significant relationship was found between PLS financing and industrial development neither in the short-run nor in the long-run. The originality of this study lies in decomposing Islamic Banks financing into PLS financing and non-PLS financing to access the contribution of each mode of financing in industrial development.

**Key words** Islamic Banking, Industrial Production, SBP, ARDL, PLS Financing.

## 1. Introduction

We live in a fast growing world that is characterized by turbulent economic changes (Prem, et al., 2017). Islamic Banking is one of the businesses that rapidly growing in global finance. Islamic banks are operating in numerous non-Muslims and all Muslim countries (Shahzad, et al., 2017). The Pakistan is one of them that has been promoting Islamic finance in the banking system. The basic goal of Islamic finance is to lead to the redistribution of wealth for improving the financial health of the needy, emphasizes universal faith and social equality for the welfare of mankind with the requirement of shariah (Ahad, 2019). Moreover, for sustaining economic growth Islamic commercial laws provides comprehensive guidelines. There is tremendous growth in the Islamic banking industry, as the value of the overall asset had been reached 1.5 trillion (USD) by the end of March 2019 as reported by the Islamic Financial Service Board (IFSB, 2019). Besides, the asset of the Islamic banking industry has increased by Rs. 132 billion to Rs. 2,790 Billion in the overall Pakistan country (IFSB, 2018). According to in Pakistan the Islamic banking system was initiated in the 1950s and the first local Islamic bank was established in a rural area in 1950. Al-Meezan Investment Bank got the first Islamic commercial banking license from State Bank of Pakistan in January 2002 and they commenced full-fledged commercial business banking operation from March 20, 2002. All the Islamic financial institutions have to conform to the shariah rules by avoiding prohibited contracts or activities and interest (riba). Without proper shariah principles, the banks and Islamic financing industries would be facing reputational risk and loss of revenue/profits because the customer of Islamic banking requires shariah compliance (Shahzad, et al., 2019).

The contribution of current research to the literature is: firstly, finding the global effect of Islamic bank financing on industrial development. Secondly, used the quarterly (monthly) data to highlight the Islamic financing growth rate (Yazdan, and Sadr, 2012; Yazdan, and Dastan, 2013; Kassim, 2016). In recent study investigates the impact of the shariah governance framework, i.e. executive management and shariah supervisory Board of Islamic banks in Pakistan (Ehsan, 2020), but still space and motivation exist to clarify that what will be the effect of the Islamic banking system on the economic condition of Pakistan. The finding of this study is revealed that there is a positive relationship between industrial production and non-profit and loss sharing financing in the long and short run, but there is a non-significant relationship between industrial production and profit and loss sharing financing. This study has examined the relationship between Islamic banking (with different perspectives; profit and loss sharing financing, non-profits and loss sharing financing, musharakah, murabahah, ijarah, istisna and profit-sharing

financing) and industrial production. Because this gap triggers the need for more research in this aspect which is being filled in this study.

The further remaining paper is organized as follows: Section II reviews the literature review. Section III describes the methodology and data collection procedure. Section IV provides a discussion on results. Section V and the last section conclude the paper.

## **2. Literature Review**

There are various reasons to introduce the Islamic banking system. The main, among these is that Islamic institutes follow the shariah rules and prohibited the interest-based system. Muslims therefore need such type of institutes, as the alternative to those conventional systems, which provide the opportunity to contribute to the economy and they promote the growth. But still the researchers are failed to properly define the relationship between Islamic banking and economic growth. Yazdan and Sadr(2012), through using the autoregressive distributed lag model explores the relationship of Islamic banks financing and economic growth in the cases of Iran and Indonesia. Their study uses the quarterly data 2000-2010. The finding of the study indicates that there's a significant bi-directional relationship between Islamic financing and economic growth in short-run and long-run periods. Similarly, Abduh and Omar(2012),investigate the relationship between economic growth and Islamic financing development in the case of Indonesia and according to the results both are bi-directional significantly related to each other in short and longrun periods.

Yazdan and Dastan (2013),has examined the effect of Islamic bank financing on economic performance in nine country cases (Bahrain, Egypt, Yemen, Malaysia, Saudi Arabia, Indonesia, UAE and Qatar) using the quarterly data from 2000-2010. Their study uses the co-integration approach model. According to the findings, a statistically positive and significant relationship exists between the Islamic bank's financing and economic growth. The result also reveals that a long-run relationship is stronger than the short-run periods. Yusof and Bahlous(2013), stated that Islamic financing has shown a positive effect on growth rate because through shariah principle enhancing the managers entrepreneurial skills and reducing the agency costs. In another study, Hachicha and Amar(2015),explain that the Islamic bank financing in Pakistan effect on economic growth is more important in short run as compare to the long run periods because in Pakistan the Islamic banks marginalized the profit and loss sharing financing activities.

Caporale and Helmi (2018) argue that the impact of Islamic banks on the causal linkages between credit and Gross Domestic Products in nations with double financial frameworks and nations without Islamic banks. They find that the long run causality running from credit to GDP is present just in the country with Islamic banks. Using the different econometric models

following; variance decompositions, vector error correction model and ARDL-bound testing approach finding the effect of financial institutions and Islamic banking on economic growth in Pakistan over the period 1997-2009. The result of this research indicates that a long term relationship exists between economic growth and Islamic banking and financial institutions (Kassim et al., 2015).

Chen and Guariglia(2013),prove that the availability of internal financing positively effects on the productivity and growth level of any country. Moreover, Kassim(2016)defines that manufacturing growth and financial development increased when an Islamic bank's financing system would be improved. On the other side, Yüksel and Canöz(2017)declared that it's not a necessity, that the Islamic financing always shows a positive effect on growth development. For example in turkey due to the very low percentage of Islamic banking in the banking sector, the Islamic financing has a non-significant effect on industrial development. Similarly, shows a negative effect on economic growth. Using the data from 1981 to 2015; (Mesagan, E., Olunkwa, N. and Yusuf, 2018)examine that there is a non-significant relationship between manufacturing sector performance and financial sector development in the nation of Nigeria. The reason for non-significance according to the researcher is low industrial production in this nation. Nigeria is a mono-product economy nation that generates its earnings from export the crude oil to other countries.

Hence, all the above studies explore the relationship of economic growth and Islamic financing but Overall, there is no signal research on the relationship of Islamic financing and Industrial development that decomposing the IF into non-PSL and PSL to define the role of Islamic business techniques. So, the main objective of this study is to investigate the relationship between the Islamic bank's financing and industrial production.

### **3. Methodology**

To assess the relationship between the Islamic bank's financing and industrial production use the monthly time series data from Pakistan throughout 2010M1 to 2018M6. The data collected from the State Bank of Pakistan. This time-series data present the overall population.

The main objective of this research is to investigate the relationship between Islamic financing and industrial production. The dependent variable is industrial production explained by the macroeconomic variables and Islamic bank's financing. The sum of musharakah and mudarabah is utilized as an indicator of the capacity of Islamic banks in activating assets through PLS-based instruments while the remainder of Islamic banks' financing is utilized as non-PLS contracts (counting murabahah, ijarah, istisna and others).

The consumer price index is incorporated as a measure of inflation. According to Kassim(2016)inflation has a negative impact on industrial output. Through

the elasticity of demand inflation shows an effect on industrial production. Based on the hypothesis of price elasticity of demand, the high quantity demanded and increasing customer price has a negative effect on each other. Thus, we propose that inflation has a negative effect on industrial production. Exporting the products to the other market improving the profits of industries and easier access the ability to the foreign markets boosting up the firms to enhance the production capacity to meet the customer demand. Thus, it is expected that export has a positive effect on industrial production. The empirical formulation of ARDL models for this study is specified as follows:

$$\Delta \ln(IPI)_t = \alpha_0 + \lambda_1 \ln(X)_{t-1} + \lambda_2 \ln(CPI)_{t-1} + \lambda_3 \ln(EXP)_{t-1} + \lambda_4 \ln(IPI)_{t-1} + \sum_{i=1}^p \beta_1 \Delta \ln(IPI)_{t-i} + \sum_{i=0}^{p1} \beta_2 \Delta \ln(X)_{t-i} + \sum_{i=0}^{p2} \beta_3 \Delta \ln(CPI)_{t-i} + \sum_{i=1}^{p3} \beta_4 \Delta \ln(EXP)_{t-i} + \mu_t \tag{1}$$

$$\Delta \ln(IPI)_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta \ln(IPI)_{t-i} + \sum_{i=0}^{p1} \beta_2 \Delta \ln(X)_{t-i} + \sum_{i=0}^{p2} \beta_3 \Delta \ln(CPI)_{t-i} + \sum_{i=1}^{p3} \beta_4 \Delta \ln(EXP)_{t-i} + v_t \tag{2}$$

$$\Delta \ln(IPI)_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta \ln(IPI)_{t-i} + \sum_{i=0}^{p1} \beta_2 \Delta \ln(X)_{t-i} + \sum_{i=0}^{p2} \beta_3 \Delta \ln(CPI)_{t-i} + \sum_{i=1}^{p3} \beta_4 \Delta \ln(EXP)_{t-i} + \phi ECT_{t-1} + \eta_t \tag{3}$$

$$\ln(IPI)_t = \alpha + \sum_{i=1}^k \beta_i \Delta \ln(IPI)_{t-i} + \sum_{j=k+1}^{k=d_{max}} \beta'_j \Delta \ln(IPI)_{t-j} + \sum_{i=1}^k \omega_i \ln(X)_{t-j} + \sum_{j=k+1}^{k=d_{max}} \omega'_j \Delta \ln(X)_{t-j} + \delta_1 \ln(CPI)_t + \delta_2 \ln(EXP)_t + v_t \tag{4}$$

**Table I- Descriptive statistics**

Statistics	C.P.I	P.L.S Variable	NON P.L.S	I.F	I.P.I	E.X.P
Mean	111.6043	30,772.55	321,378.6	296,697.2	551.4522	58,800.11
Median	102.5533	20,246.99	447,541.9	291,410.9	92.5011	74,992.55
Max.	122.6006	56,200.12	577,922.3	452,046.3	155.9233	92,521.66
Min.	82.30030	23,677.722	120,501.2	135,309.2	82.00241	50,644.21
S.D	8.225676	20,442.02	81,600.82	103,997.6	22.85119	5,561.100
Obs.	100	100	100	100	100	100

$$\ln(X)_t = \gamma + \sum_{i=1}^k \varphi_i \Delta \ln(IPI)_{t-i} + \sum_{j=k+1}^{k=d_{max}} \varphi'_j \Delta \ln(X)_{t-j} + \sum_{i=1}^k \omega_i \ln(X)_{t-j} + \sum_{j=k+1}^{k=d_{max}} \omega'_j \Delta \ln(X)_{t-j} + \theta_1 \ln(CPI)_t + \theta_2 \ln(EXP)_t + v_t \tag{5}$$

**4. Result and Discussion**

**4.1. Descriptive statistics**

Table I shows the descriptive statistics of all the variables that have been used in the research. The revenue of the IPI (which is equal to 114.8738) and the

revenue of CPI (which is equal to 109.5039) show that production from industries and rise of prices has increased on an average of 14.8738 percent for IPI, and 9.5039 percent for CPI during some period. From Table I, it can be deduced that 6.89 percent of total financing is represented by PLS. In Chong and Liu(2009),Hachicha and Amar(2015) and Abid and Mufti(2017) the findings are quite similar to the deduction from Table I.

#### 4.2. Unit root tests

In the ARDL approach, there is no need of integration of variables in the same order. The variables can be integrated of I(0) order or I(1) order or even the combination of both. But in the case when one of the variable is integrated of order two, i.e. I(2), this approach can become unsuitable.

So for this, two-unit root test is performed to check whether all the variables are I(0) or I(1). In the two-unit test, the first test is Augmented Dickey–Fuller (ADF) test and the second test is Phillips–Perron (PP) test. In Augmented Dickey–Fuller (ADF) test, autocorrelation is adjusted. In Phillips–Perron (PP) test, both autocorrelation and heteroscedasticity are adjusted.

In Table II, the results of unit root tests are stated. The result of the table directs that the logs of total IF, non-PLS, CPI and total EXP are all at stationary level. This means that they are integrated of order I(0). On the other hand, the logs of IPI and PLS have unit roots at their level. But after the first difference, they become stationary and become integrated at order one I(1). So ARDL approach is needed to monitor the co-integration, i.e. to combine I(0) and I(1) variables.

Variables	Level	ADF test		PP test	
		First difference	Level	First difference	Stationarity status
ln{PLS}	-3.112***	-4.232***	-4.522**	- 41.522***	I(0)
ln{nonPLS}	-3.771***	-8.144***	-1.027**	- 10.230***	I(0)
ln{CPI}	-1.052	-7.633***	-1.535	-6.556***	I(1)
ln{EXP}	-1.044	-	-4.788***	- 10.012***	I(0)
ln{IPI}	-0.299	15.166***	-1.021	- 10.667***	I(1)
ln{IF}	-2.852***	-8.522***	-1.902**	- 20.216***	I(0)

Where: \*\*, \*\*\* represents the level of significance at 5 and 1% respectively.

#### 4.3. Results of co-integration test

The foremost step in studying the long-run relationship between variables is to examine the co-integration by calculating the F-statistics. The two critical bounds were provided in Pesaran et al. (2001). The first one was for ARDL model when all the regressors are I(0); if the calculated F-statistic is greater than the upper critical value. This indicates that the null hypothesis without the co-integration long-run relationship can be excluded. In Table III, the results of bound tests for three models are mentioned, which shows that null hypothesis can be excluded at 1 percent of level of significance. By the results, it can be known that a long-run relationship is present between variables.

#### 4.4. Estimates of the long-run relationship

Firstly, the long-run relationship was estimated between total IF and industrial productions. The financing was broken down into PLS and non-PLS modes. Table IV shows the results of the estimates of the three models. The total IF turns have an important positive coefficient which recommends that 1 percent change in IF leads, ceteris paribus, to 0.254 percent rise in industrial production. This significant role of IF in industrial growth in Malaysia can be stated with reference to financial contracts of Islamic banks, which are supposed to get connected to the real economy (Gulzar and Masih, 2015;Kammer et al. 2015).

**Table III- Bounds TEST results**

Computed F-statistic	Model I	Model II	Model III
	F = 15.002	F = 15.164 (k = 3)	F = 16.812
Levels of significance (%)	I (0)		I (1)
1	5.33		6.08
5	4.22		5.12
10	3.07		4.12

\*\* The critical values are based on Pesaran et al. (2001)

This outcome is dependable on previous findings which includes; Chen and Guariglia(2013) for China, Kassim, (2016) for Malaysia, Mesagan et al.(2018)for Nigeria and (Muhammad et al. 2019) for Pakistan. Breaking down total IF into PLS financing (which consists of mudarabah and musharakan) and no- PLS financing, it was highlighted that there is no proof on the long-run relationship between PLS financing and industrial growth. On the other hand, the evidence of strong connection between non-PLS and

industrial growth was provided. The possible clarification of this result is that very small portion of Islamic banks' financing in Malaysia is biddable with PLS principles (Chong et al. 2009; Hachicha and Amar 2015). The CPI (measure of inflation) shows a negative effect on industrial production in the three models. This result verifies the results of Kassim, (2016) of Malaysia, and Baharumshah et al.(2016) in a board of 94 emerging countries. But still, the influence of inflation is statistically helpful only in Model III. The variable EXP starts with good hopes and is beneficial in the three models. The outcome is estimated to give easier access to foreign markets which would boost the companies to enhance the production capacity to meet customer high demands. The outcomes of the diagnostic tests are shown in second part of Table IV. By looking at those results, it can be deduced that there is no serial correlation among residuals, for the three models, at 5 percent level of significance. Also the residuals are apparently normally distributed and homoscedastic.

**Table IV- ARDL estimates of long-run relationship**

Regressors	Model I (I.F)		Model II (w-P.L.S)		Model III (w.o-P.L.S)	
	Coefficients	tstatistics	Coefficients	t-statistics	Coefficients	t-statistics
ln{PLS}	-	-	1.132	1.556	-	-
ln{non PLS}	-	-	-	-	0.572***	5.311
ln{CPI}	-1.732	-0.4	-0.556***	-1.723	-1.671	-1.015
ln{EXP}	1.557***	4.002	1.127**	3.092	1.525***	4.014
ln{IF}	1.155***	40.382	-	-	-	-
Intercept	2.344	1.92	-4.159**	-4.107	1.52	1.802
Observations	100	100	100	100	100	100
Diagnostical statistics						
Serial correlation	2.244 [0.145]		2.343 [0.266]		2.622 [0.466]	
Normality	2.341 [0.611]		2.781 [0.744]		2.110 [0.822]	
Heteroscedasticity	2.344 [0.622]		2.566 [0.820]		2.101 [0.714]	

Where: \*\*, \*\*\* represents the level of significance at 5 and 1% respectively

#### 4.5. Estimates of short-run relationship and the error correction model

Table V shows the outcomes of the short-run relationship between industrial production and Islamic banking. It shows that IF is beneficial for industrial production in the short run. The coefficient of IF is 0.1830 and it was statistically important at 1 percent level. This indicates that 1 percent change in IF, ceteris paribus, to 0.1830 percent growth in industrial production. This result is similar to the result of Kassim(2016) of Malaysia. Also it can be noted don that shot-run relationship is smaller than long-run relationship. This outcome verifies the outcome of Yazdanand Dastan(2013) in nine countries in



the region of Asia and Arab. The error correction terms have negative signs in the three models, which recommend that an adjustment process towards equilibrium exists. Whereas, it is also highlighted that PLS financing does not influence industrial growth in the short-run relationship. On the other hand, non-PLS financing has positive and significant influence on industrial growth in the short-run. So at last, all the plots of Cumulative Sum of recursive residuals (CUSUM) are inside the critical range of 5 percent significance level (figure 1, 2 and 3). Thus, the null hypotheses of constancy of all the coefficients in the regressions are adequate.

**Table V. ARDL short run estimated relationship**

Regressors	Model I (I.F)		Model II (w-P.L.S)		Model III (w.o-P.L.S)	
	Coefficients	t-statistics	Coefficients	t-statistics	Coefficients	t-statistics
$\Delta(\ln P.L.S)$	-	-	1.143	1.61	-	-
$\Delta(\ln \text{non-P.L.S})$	-	-	-	-	1.072***	5.022
$\Delta(\ln C.P.I)$	-1.103	-0.032	-1.719	1.161	-0.528	-0.994
$\Delta(\ln E.X)$	1.546***	9.219	0.5662***	9.026	0.575***	9.01
$\Delta(\ln I.F)$	1.553***	5.092	-	-	-	-
$\Delta(\ln C.P.I[1])$	-	-	-3.771**	-4.113***	-	-
$\Delta(\ln C.P.I[2])$	-	-	5.053***	4.028	-	-
$\Delta(\ln C.P.I[3])$	-	-	-4.462***	-4.066	-	-
E.C.M(1)	-1.442***	-8.012	-0.663***	-6.022	0.781***	-9.099
Observations	100		95		100	

Where: A.R.D.L (1, 0, 0, 1) is selected for I.F and non-P.L.S while A.R.D.L (1, 0, 4, 1) is selected for P.L.S based on Schwarz criterion. \*\*, \*\*\* represents the level of significance at 10 and 1% respectively

#### 4.6. Toda and Yamamoto causality test result

Toda and Yamamoto causality test is used to identify the direction of causality between industrial growth and components of financing of Islamic banks. To calculate the optimal lag length k, it is necessary to use Akaike information criterion and SBC. The experimental results of the causality test is mentioned in Table IV, which reveals that bidirectional relationship between industrial growth and Islamic banking exists, as it can be measured in aggregate terms or non-PLS terms only. On the other hand, causality relationship between PLS and industrial growth does not exist.

**Table VI- Causality test results**

Null hypothesis	df	x2	Probability	Direction of causality
P.L.S does not granger cause I.P.I	5	5.0925	1.5628	

I.P.I does not granger cause P.L.S	5	2.003	0.8732	No causality
I.F does not granger cause I.P.I	5	13.0134	0.01778	Bidirectional causality
I.P.I does not granger cause I.F	5	13.997	0.0162	
Non-P.L.S does not granger cause I.P	5	13.576	0.0157	Bidirectional causality
I.P.I does not granger cause non-P.L.S	5	15.1221	1.7742	

## 5. Conclusion

The growth of Islamic finance industry and rising market share of Islamic banking in Malaysia makes it important to measure the contribution of financing of Islamic banks to the growth of industry. So the main objective of this study was to study the role of each mode of financing of Islamic banks to industrial growth, empirically. By using the ARDI and bound testing methods, this study shows the proof that the financing of Islamic banks has a significant contribution in improving industrial growth and this progressive effect comes from non-PLS financing, both in short and long runs. On the other hand, without major effect of PLS financing on industrial growth can be endorsed as a fact that *mudarabah* and *musharakah* (which are long-term financing contracts) need much time to give a result. So, upcoming study on this topic must use much time for research. The Toda and Yamamoto causality test shows a bidirectional between industrial growth and IF and non-PLS. On the other hand, there is no relationship between industrial growth and PLS. These conclusions have some policy consequences. There is an existence of time interval between pooling of funds through PLS contracts and their direction towards productive investment activities shows that Malaysian Islamic banks must sustain long-term relationship with investment account holders. Other than this, Islamic banks are ordered to enhance the portion of PLS financing. Thus, the policymakers in Malaysia must increase their efforts to expand the Islamic banking history because of the positive linkage between IPI and non-PLS in both; short-run and long-run.

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