

Testing Profit and Loss Sharing to Stabilise Level of Inflation: Evidence From Indonesia

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Abstract

The objective of this research is for testing whether profit and loss sharing (PLS) can stabilise inflation compared to interest rate. By using ARDL bound test with monthly data from January 2012 to May 2016, the result shows that PLS that is proxied by national sukuk, *mudharabah* and *musharakah* and interest rate simultaneously can affect inflation in Indonesia. Based on coefficient value analysis, PLS that is proxied by national sukuk can stabilise level of inflation in the long run only. *Musharakah* as other proxy of PLS can stabilise inflation in the short run only. However, *mudharabah* cannot be used to stabilise inflation both the short run and long run.

Keywords: profit and loss sharing, inflation, interest rate, ARDL bound test

1. Introduction

Fundamental determinant of human welfare is consumption of goods and services (Deaton, 2015). Therefore, stable level of inflation as a proxy of human welfare is important to assure the ones can afford to buy their necessities. Furthermore, Indonesia government authorizes Bank of Indonesia the main objective to maintain and achieve stability of rupiah value against goods and services which is reflected by the rate of inflation.

Start from 1999, Bank of Indonesia (BI) has been adopting inflation targeting to stabilise price by influencing expectation of inflation and coordinating with government (Kenward, 2013). However, based on data published on official BI's website from 2001 to 2016, BI has failed to achieve inflation in target range for 11 times and 6 of it is higher than target range that has been set. In addition, some economist such as Blanchard (1997) explained that stable price is zero inflation. Kunio Okina, ex-director at the Bank of Japan, in Nishizaki and Watanabe (2000) and Hoover (2012) also argued that zero level of inflation is an optimal target for monetary policy. However, based on BI monthly data as depicted in Figure 1 below, Indonesia never achieve zero inflation or event near zero inflation yet.

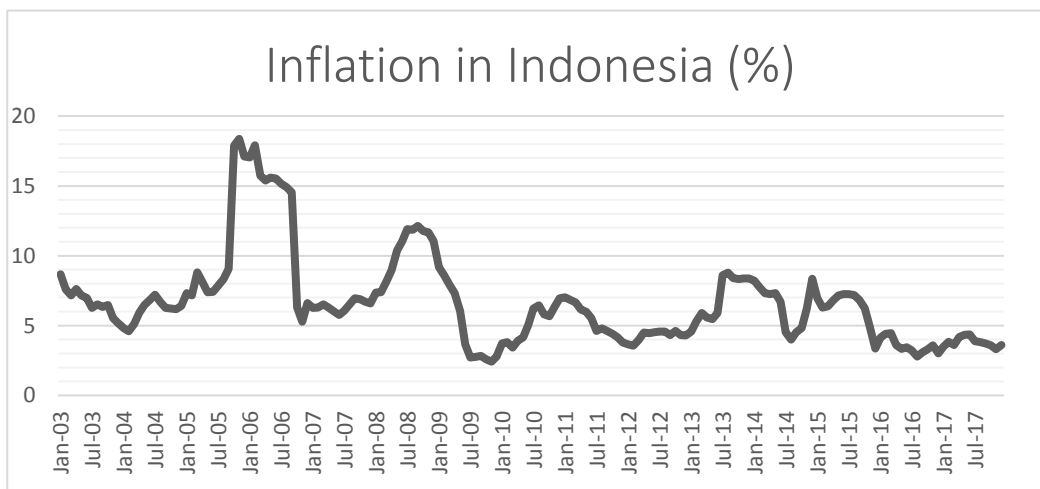


Figure 1

Source: Bank of Indonesia, 2018 (Processed with MS Excel 2013).

The chart above depicts the fluctuation movement of inflation in Indonesia. It also delineates that Indonesia never gain stable price in the form of zero inflation or even near-zero inflation. The lowest rate of inflation ever gained is 2.41% in November 2009, and there is no increasing level of inflation at the rate of 2% or even 1%, nor 0%. Moreover, at that observed period, the highest rate of inflation is 18.38% in November 2005.

Zero inflation definition as a form of price stability is still debatable. Aiyagarin (1990)'s study showed that shifting inflation to zero will lead to higher cost than benefit, Nishizaki and Watanabe (2000) also argued that Phillips curve become flatter at the rate of inflation approaches zero, making inflation very sensitive to unemployment. However, other study such as Sunel (2018) shows that disinflation will increase welfare, Wolman (1997) shows that as inflation reduce from 5 per cent to zero, the consumption of output will increase by 0,6 percent.

Suhariyanto, head of Indonesian Statistics, said that for the first time since 1999 Indonesia unemployment rate decline to 9,82 per cent or one digit under 10 per cent (Note 1). However, if inflation is not maintained to be stable, that achievement will be meaningless since inflation will reduce purchasing power of citizen. Meaning that eventhough unemployment rate decline because of the rise of income, there will be meaningless as inflation also rise because it will "tax" income and reduces citizen's ability to buy something. Therefore, its important to make inflation in Indonesia to be stable.

Chishti (1985) in his study explained that Profit and loss sharing (PLS) will make investment more stable compared with advanced capitalist economy that uses interest rate. If this argument is related to aggregate demand theory, then investment under PLS will bring more stable inflation in the long run rather than investment under interest rate. Therefore, the main objective of this study is to investigate the relation of PLS and also interest rate to inflation in Indonesia.

The next chapter of this paper will present the theoretical background that explains on how PLS can stabilise investment rather than interest rate and also review some previous researches on the topic. Next chapter will explain research method in this paper, then result and discussion of the finding will be presented, and the last is conclusion.

2. Theoretical Background

2.1 Inflation

Inflation is a general and ongoing rise in the level of price in an entire economy (Openstax, 2014), but not refer to relative price since relative price is the price of goods relative to other goods (Mankiw, 2012). In historical aspect, the early history about inflation measurement according to O'neill, Ralph and Smith (2017) can be tracked in the 1700-1879 because from 1880 onward, official organisations had formalised and managed data collection. The conclusion of that data then were used for political decision making which same as practice in modern era (O'neill, Ralph and Smith, 2017).

inflation can be measured based on Consumer Price Index (CPI) and/or GDP deflator. CPI measures the retail price of a "fixed market basket" of several thousand goods and services purchased by household (Froyen, 2013). Deflator GDP or *implicit price deflator for GDP* is the ratio of nominal GDP to real GDP, a measurement of overall level of price that shows the cost of the currency produced basket of goods relative to the cost of that basket in a base year (Mankiw, 2012).

Basically, aggregate demand tries to conceptualise monetary and fiscal policy that will affect to both output and general price. Some instruments that included to monetary policy is money supply, and for fiscal policy is government expenditure and taxation with the assumption of closed economy. Furthermore, as the aggregate demand swift outward, this will lead to increasing output in the short run, and followed by the rise of general price (inflation) in the long run.

2.2 Relative Stability on Profit and Loss Sharing

Chishti (1985) in his paper "the relative stability of interest-free economy" explained on how PLS can stabilise investment rather than interest rate. The main idea of his notion is that under Islamic financial system, the amplitude of business cycles (euphorism or booming condition and pessimism or recession condition) which are inherent characteristics of advanced capitalist economy will be smaller (Chishti, 1985). For simplicity, Chishti (1985)'s notion can be illustrated in the graph below.

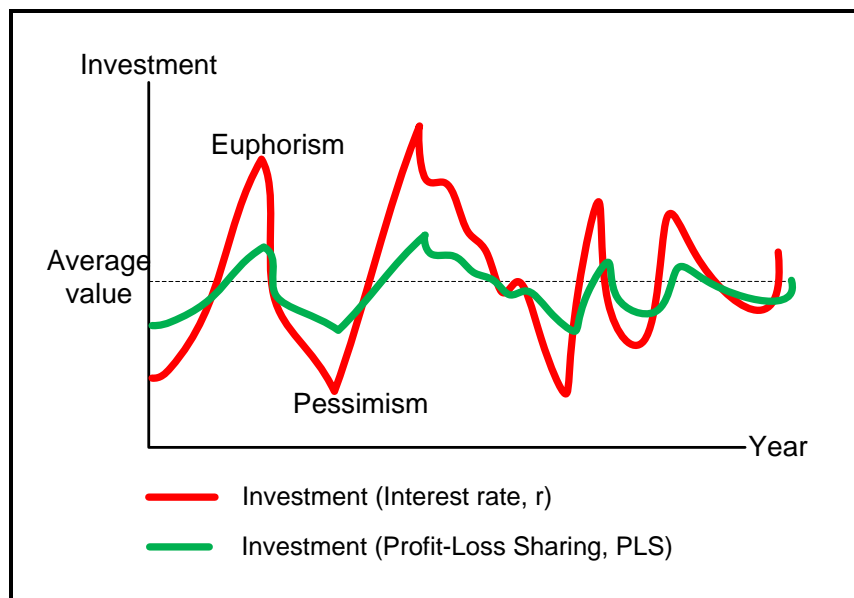


Figure 2. Investment under interest and PLS

Source: Researcher's own illustration adopted from Chishti (1985)'s explanation.

Assuming that this kind of investment is money that is borrowed or lent (with interest or PLS scheme) to be used to buy equipment and other structures in production (synthesis from Mankiw, 2012), as depicted in the graph above, the red line depicts euphorism or booming condition and also pessimism or recession condition in advanced economy. Chishti (1985) claimed that the high fluctuation in the red line investment is because of fixity of the dated payment commitment (payment of interest and principal in investment) whereas profit is uncertain. Chishti (1995) argued that if the uncertainty of profit is linked to payment commitment (by using PLS) in a way that they move together, the investment will be more stable rather than very fluctuative (depicted in the green-line of above graph).

Starting from the sharp increase of red-line investment, this happens because of euphoric economic condition in business cycle that lead profit to be predicted to significantly increase more that payment commitment. This underlying condition makes investment increase sharply that is signed by many investors lending their money because they see potency of higher return if they invest in the booming condition.

In the sharp decrease of red-line investment, profit is predicted to significantly go down under payment commitment. Investment will be almost stop because of many bankruptcies, and capital loss and at the same time borrowers still have to pay its commitment (interest and principal). This condition lead investors will not lending their money and making investment rate significantly go down.

However, under Profit and Loss Sharing (PLS), all phases of business cycle the amplitude would be smaller (Chishti, 1985). This because of PLS accomodates uncertainty of profit that will or will not be gained in both two business cycle condition. Therefore, in the booming period, investment in PLS scheme is less than based on interest rate. Likewise in the recession period, PLS still makes investment reduce but not much higher than investment from interest rate.

Then, continuing the above explanation with concept of aggregate demand, the fluctuation of investment shifting the IS curve and affecting to aggregate demand curve upward or downward, then in the long run fill affect to general price level. Based on Chishti's (1985) theory then, investment that based on interest rate will more fluctuative compared to investment under profit and loss sharing. Therefore, in the long run, fluctuation of general price will be more stable under investment that based on PLS rather than interest rate. Ascarya (2017) showed that PLS can be used to cure financial crisis that is proxied by economic growth and inflation. Ariff (2015) explained that the of sukuk can tame debt. As sukuk is under PLS, this argument support Chishti (1985)'s theory. Krishnamurthy, Pelletier, and Warr (2018) also show that equity and mutual fund can be used to make inflation lower.

2.3 Interest Rate on Inflation

in Fisher effect, a 1 percent increase in the rate of inflation causes a 1 percent increase in nominal interest rate (Mankiw, 2012). Anari and Kolari (2016) explained the causality process in Fisher theory where the positive relation for one to one relationship between nominal interest rate and expected inflation comes firstly from inflation rate to interest rate. However, Anari and Kolari (2016) also explained the other perspective that comes from Wicksell theory where inflation and interest rate has negative relationship and for causality process, they comes firstly from interest rate to inflation, meaning that an increase in the rate of interest will decrease the rate of inflation, the invers of Fisher theory.

Lee (2007) found the positive relation between nominal interest rate and inflation while rejecting the notion of a full Fisher effect. Demary and Hutler (2015) also explains that the low level of inflation is because of low equilibrium of real interest rate and under full employment and stable price with combination of zero lower bound on nominal interest rate. Other studies such as Booth and Ciner (2001), and Linnemann (2005) also find the positive relation between interest rate on inflation.

3. Research Method and Data

3.1 Data

This paper uses quantitative approach. Profit and loss sharing (PLS) is proxied by national sukuk; *mudharabah* and *musharakah* since these variables also use PLS scheme in its *akad*. Interest rate is proxied by BI rate, and inflation is proxied by consumer price index (CPI). All data are gathered from Bank of Indonesia for BI rate and national sukuk, *mudharabah* and *musharakah*, are gathered from Financial Services Authority (*Otoritas Jasa Keuangan*). The data are monthly time series from January 2012 to May 2016. Statistical tool that is used in this research is *autoregressive and distributed lag* (ARDL) bounds test approach developed by Pesaran, Shin and Smith (2001) (Known as PSS).

The advantage of this approach is that it applicable to a set of time series albeit series are $I(0)$ and/or $I(1)$ or in other words, the ARDL method was shown to work regardless of the order of integration the time series under consideration (Rushdi, Kim, and Silvapulle, 2012). Other advantage of this method is that it is more robust and performs better for small sample size than other co-integration technique (Akmal, 2007). Following Omar, Hussin, and Ali GH (2015), by using this approach, there are two hypotheses that will be examined. The first is to examine the long run relationship simultaneously (co-integration), and the second to study long run and short run for each of variables. The hypotheses of this research can be written in the table below (Omar, Hussin, and Ali GH, 2015).

Table 1. Research hypotheses

H	Research Hypotheses
General level relation	
H-1	There is a general level relation between profit and loss sharing (proxied by national sukuk; <i>mudharabah</i> and <i>musharakah</i>) and controlled variable (Interest rate) on inflation
Partial level relation	
	National sukuk affects inflation in the long run
H-2	<i>Mudharabah</i> affects inflation in the long run
	<i>Musharakah</i> affects inflation in the long run
	Interest rate affects inflation in the long run

Source: Researcher, 2018

3.2 Model Specification and Research Method

Akmal (2007) explained that the underlying statistic of ARDL bounds test approach is familiar wald or F-statistics in a generalized Dickey-Fuller type regression which is used to test the significance of lagged variable under unrestricted equilibrium error correction model (ECM). Following Acaravci, Acaravci, and Ozturk (2011) to re arrange model in this research, model specification below is used to examine hypothesis H-1 or the existence of long run relationship among variables simultaneously.

$$\Delta \text{Ln inf} = a_1 + \sum_{i=1}^{p1} \phi_{1i} \Delta \text{Ln inf}_{t-1} + \sum_{j=0}^{q1} \beta_{1j} \Delta \text{Ln NS}_{t-j} + \sum_{k=0}^{r1} \beta_{2k} \Delta \text{Ln MD}_{t-k} + \sum_{l=0}^{s1} \beta_{1l} \Delta \text{Ln MS}_{t-l} + \sum_{m=0}^{t1} \beta_{1m} \Delta \text{Ln BIRATE}_{t-m} + \partial_1 \text{Ln inf}_{t-1} + \partial_2 \text{Ln NS}_{t-1} + \partial_3 \text{Ln MD}_{t-1} + \partial_4 \text{Ln MS}_{t-1} + \partial_5 \text{Ln BIRATE}_{t-1} \varepsilon_{1t}$$

equation 1

Taking Ln for natural log, ε_{1t} and Δ stand for the white noise term and the first difference operator respectively, inf is inflation; NS is National Sukuk and MD is *mudharabah*, MS is *musharakah*, and BIRATE is interest rate. The Null hypothesis for no cointegration (non-existence of long-run relationship) for variable inf against alternative hypothesis is given as:

$$H_0: \partial_1 = \partial_2 = \partial_3 = \partial_4 = \partial_5 = 0$$

$$H_a: \partial_1 \neq \partial_2 \neq \partial_3 \neq \partial_4 \neq \partial_5 \neq 0$$

Omar, Hussin, and Ali GH (2015) explained for testing the above hypothesis by using the F-statistics where if the computed F-statistics is higher than upper bounds critical value, then null hypothesis will be rejected which means there are long-run relationship between government revenue and government debt to Inflation simultaneously.

After equation 1 of long run co-integration test model is computed, Acaravci, Acaravci, and Ozturk (2011) explained that if any evidence of long run relationship (cointegration), the next step is estimating the following long run and short run models respectively to test hypothesis H-2.

$$\text{Ln inf}_t = a_2 + \sum_{i=1}^{p2} \phi_{2i} \text{Ln inf}_{t-i} + \sum_{j=0}^{q2} \beta_{2j} \text{Ln NS}_{t-j} + \sum_{k=0}^{r3} \beta_{3k} \text{Ln MD} + \sum_{l=0}^{s4} \beta_{3l} \text{Ln MS} + \sum_{m=0}^{t5} \beta_{3m} \text{Ln BIRATE} + \varepsilon_{2t}$$

equation 2

$$\Delta \text{Ln inf}_t = a_2 + \sum_{i=1}^{p2} \phi_{2i} \Delta \text{Ln inf}_{t-i} + \sum_{j=0}^{q2} \beta_{2j} \Delta \text{Ln NS}_{t-j} + \sum_{k=0}^{r3} \beta_{3k} \Delta \text{Ln MD}_{t-k} + \sum_{l=0}^{s4} \beta_{3l} \Delta \text{Ln MS}_{t-l} + \sum_{m=0}^{t5} \beta_{3m} \Delta \text{Ln BIRATE}_{t-m} + \Psi \text{ECT} + \varepsilon_{2t}$$

equation 3

Ψ is the coefficient of error correction term (hereafter ECT). It shows how quickly variables converge to equilibrium and it should have a statistically significant coefficient with a negative sign (Acaravci, Acaravci, and Ozturk, 2011). before proceeding ARDL bound test, as explained by Akmal (2007) and Obradovic *et al* (2017), unit root testing will be used for avoiding the possibility of certain variables being of the order I (2) or higher. This because if any presence of I (2) variables, the computed F-statistics are not valid because bounds test is based on the assumption that the variables are I(0) or I(1) (Akmal, 2007). Then after testing for Unit Root, *Akaike information Criterion* (AIC) is employed to determine optimal lag length of ARDL (p, q, r) as proposed by Gujarati and Porter (2009).

Then the last, as Gujarati and Porter (2009) explained that time series data may have not the same parameter of the model through the entire time period, or known as structural change, Shahbaz, Islam and Rehman (2016), and Bahmani Oskooee and Kanitpong (2017) proposed CUSUM and CUSUM sq test for the stability of the long run and short run coefficient because of any structural change in the period. The table below resume variables in this research.

Table 2. Variables in this research

Variable	Definition	Proxy	Source of Data
Inflation (Inf)	a general and ongoing rise in the level of price in an entire economy	CPI	percentage change of CPI from bank of Indonesia January 2012 – May 2016
National (NS) Sukuk	National Sukuk is shari’ah bond which is issued according to shari’ah principle (<i>Mudharabah</i> , <i>Musyarakah</i> , and others). (The Law	Outstanding SBSN	bank of Indonesia January 2012 – May 2016

Number 19, year 2008).					
<i>Mudharabah</i> (MD)	form of partnership where one of the contracting parties, called the <i>sāhib al-māl</i> or the <i>rabb al-māl</i> (the financier), provides a specified amount of capital and acts like a sleeping or dormant partner, while the other party, called the <i>mudārib</i> (entrepreneur), provides the entrepreneurship and management for carrying on any venture, trade, industry or service with the objective of earning profits (Chapra, 1997)	<i>Mudharabah</i>	Financial Authority	Services (OJK),	January 2012-Mei 2016
<i>Musharakah</i> (MS)	<i>Shirkah</i> (or <i>sharikah</i>) refers to partnership between two or more persons whereby, unlike <i>mudārabah</i> , all of them have a share in finance as well as entrepreneurship and management, though not necessarily equally (Chapra, 1997)	<i>Musharakah</i>	Financial Authority	Services (OJK),	January 2012-Mei 2016
Interest rate (BIRATE)	Payments for the use of money expressed as a percentage of the purchase price or principal of loan, bond, or other financial instrument (Hoover, 2012).	BI Rate	bank of Indonesia	January 2012 – May	2016

Source: Researcher from many sources (2018).

4. Result and Discussion

4.1 Descriptive Statistics

Descriptive statistic is defined as a number that convey a particular characteristic of a set of data (Spatz, 2008). In this research, there are inflation, national sukuk, mudharabah, musharakah, and interest rate which are presented in table below.

Table 3. Descriptive statistic

	<i>Inflation (%) CPI</i>	<i>National Sukuk (Billion Rupiah)</i>	<i>Mudharabah (Billion Rupiah)</i>	<i>Musharakah (Billion Rupiah)</i>	<i>Interest rate (%)</i>
Mean	5,82	140,04	13,27558	41,37011	6,83
Median	5,57	132,29	13,802	40,583	7,25
Range	5,46	198,97	5,69	45,757	2
Minimum	3,33	61,28	10,039	18,759	5,75
Maximum	8,79	260,26	15,729	64,516	7,75
Sum	308,49	7422,07	703,606	2192,616	362,25
Count	53	53	53	53	53

Source: Researcher, 2018

From descriptive statistics above, the highest level of inflation is 8,79% and the lowest rate is 3,33%, summing up all the data, the total of inflation from observation date is 308,49% with average rate (mean) is 5,82 %. For national sukuk, The highest level is 260,2 billion rupiah, the lowest level is 61 billion rupiah, and the total of national sukuk is 7422,07 billion rupiah with average rate (mean) is 140,04 billion rupiah. highest level of *mudharabah* is 15,72 billion rupiah and the lowest one is 10,03 billion rupiah whereas the highest level of *musharakah* is 64,51 and the lower one is 18,75 billion rupiah, summing up all the data, the total level of *mudharabah* from observation date is 703,606 billion rupiah and 2192,61 for *musharakah* with average rate (mean) is 13,27 for *mudharabah* and 41,37 for *musharakah*.

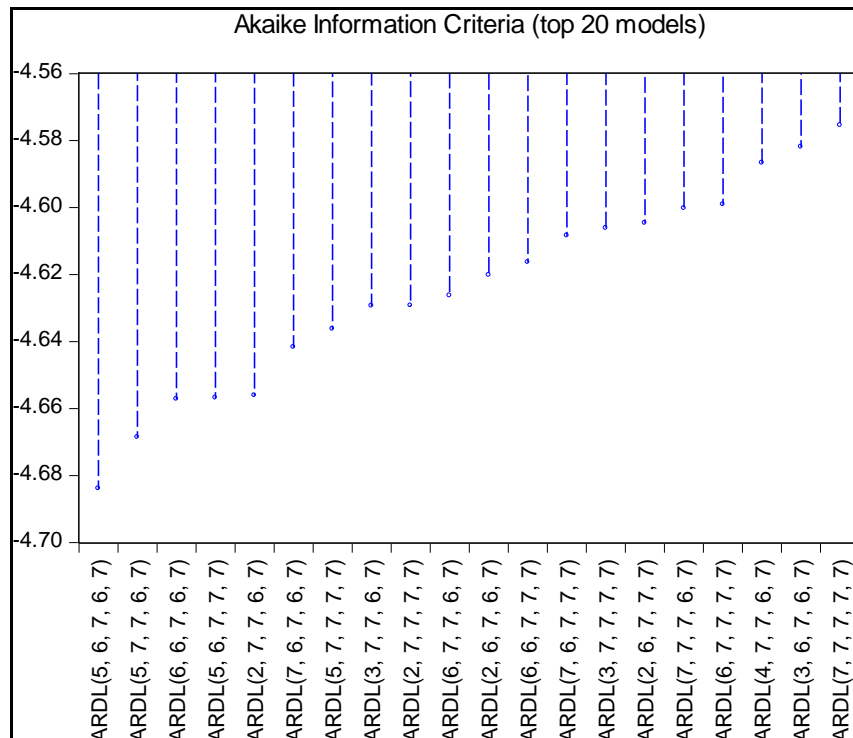
In Interest rate, the highest level of interest rate is 7,75% and the lowest rate is 5,75%, summing up all the data, the total of interest rate from observation date is 362,25% with average rate (mean) is 6,83 %. For the measurement of dispersion, range that measure the difference between the greatest and the smallest (Mirer, 1995) in inflation data set shows 5,46 per cent, national sukuk is 198,97 billion rupiah, *mudharabah* is 5,69 billion rupiah, 45,76 billion rupiah for *musharakah* and interest rate is 2 per cent. .

The value of the middle observation of inflation, national sukuk, *mudharabah*, *musharakah*, and interest rate after the observations have been ordered from smallest to largest (Mirer, 1995) or, median value, is 5,57% for inflation, 132,29 billion rupiah for national sukuk, 13,8 billion rupiah for *mudharabah*, 40,6 billion rupiah for *musharakah*, and 7,25 per cent for interest rate. For studying the “shape” of a probability distribution, then skewness and kurtosis is used (Gujarati and Porter, 2009)

4.2 Unit Root Test

Akeike Information Criterion (AIC) is employed to gain the lag length in ARDL approach automatically with maximum lag pegged to 7. From AIC, the optimal length for lag is ARDL (5,6,7,6,7) as depicted in Table 4 below.

Table 4. AIC for model selection



Source: Researcher, 2018 (Computed with Eviews 9)

Furthermore, the result of ADF test for each variables is presented as follow.

Table 5. Unit root testing using the ADF test

Variable	Model	Augmented Dickey-Fuller (ADF) test – t stat.		Decision
		Levels	First Difference	
Inflation	Intercept	-2,367	-5,244***	I(1)
	Intercept and Trend	-2,081	-5,661***	I(1)
	none	-0,342	-5.297***	I(1)
National sukuk	Intercept	-1,066	-7,811***	I(1)
	Intercept and Trend	-3,549	-7,775***	I(1)
	none	-3,237	-6,402***	I(1)
Mudharabah	Intercept	-2,098	-4,744***	I(1)
	Intercept and Trend	-2,233	-4,935***	I(1)
	none	1,865	-4,259***	I(1)
Musharakah	Intercept	-3,196**	-5,907***	I(1)
	Intercept and Trend	-1,151	-6,865***	I(1)
	none	8,587	-2,059**	I(1)
Interest rate	Intercept	-1,999	-3,778***	I(1)
	Intercept and Trend	-1,216	-4,071**	I(1)
	none	0,641	-3,732***	I(1)

(***), (**), (*), indicate 1%, 5%, and 10% level of significance, respectively

Source: Researcher's own computation, 2018 (Using Eviews 9)

Since the data are integrated of order 1, I(1), and there is no data that has I(2), then ARDL bounds test can be performed to analyse these variables in this research.

4.3 Test for Co-integration

Table 6. ARDL Bounds Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	15.43679	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	3.79	4.01
2.5%	3.25	4.49
1%	5.15	5.06

Source: Researcher's own computation (Using Eviews 9)

Based on that result, to reject null hypothesis, value of F-statistics must be above upper bound proposed by the system. F-statistics shows 15,44, higher than upper bound 5,06 at the 1% level of significance, meaning that H_0 can be rejected or it can be concluded based on the general level relation that there is a general level relation among national sukuk, *mudharabah*, *musharakah* and interest rate on inflation in Indonesia, or the model is co-integrated, or has long run relationship simultaneously. The result supports Chishti (1985)'s theory where PLS can affect inflation, where in this research PLS is proxied with national sukuk, *mudharabah*, and *musharakah*. Furthermore, to prove that inflation that comes from PLS is more stable than inflation that comes from interest rate in the long run, equation two and three will be employed.

4.4 Test for Short Run and Long Run

To prove whether PLS will bring stable inflation than interest rate, this paper uses sensitivity analysis where if coefficient of PLS - inflation is less than coefficient of interest rate - inflation, then it can be said that PLS is more stable than interest rate. Then, as the model in equation 1 is co-integrated, equation 2 and 3 will be analysed to know the long run and short run relationship individually for testing the H-2 hypotheses and to see the coefficient. Based on the theory, PLS will bring more stable level of inflation than interest rate. Table below shows the result.

Table 7. The long run and short run coefficient

Long run				
ARDL (5,6,7,6,7) selected by Akeike Information Criterion				
Dependent variable is inf (Inflation)				
Regressor	Coefficient	Standard Error	T-Statistics	P-value
Ln NS (National Sukuk)	-2,52	0,72	-3,49	0,005
Ln MD (<i>Mudharabah</i>)	13,178	1,71	7,707	0,000
Ln MS (<i>Musharakah</i>)	-1,233	0,746	-1,651	0,129
Ln BIRATE (Interest rate)	-6,173	1,488	-4,148	0,002
C (Constanta)	-72,88	9,65	-7,55	0,000
The short run coefficient with Error Correction Model				
Regressor	Coefficient	Standard Error	T-Statistics	P-value
Δ Ln NS (National Sukuk)	-0,468	0,373	-1,252	0,238
Δ Ln MD (<i>Mudharabah</i>)	4,177	0,99	4,19	0,001
Δ Ln MS (<i>Musharakah</i>)	-2,564	1,019	-2,516	0,03
Δ Ln BIRATE (Interest rate)	2,666	0,94	2,831	0,017
ECT _{t-1}	-0,97	0,227	-4,267	0,001
R-squared	0,970	Mean dependent var	-0,002	
Adjusted R-squared	0,860	S.D. Dependent var	0,06	
S.E or regression	0,020	Akaike info criterion	-4,68	
Sum Squared Resid	0,005	Schwarz criterion	-3,25	
Log Likelihood	143,7	Hannan-Quinn Criter	-4,14	
F-statistics	9,270	Durbin-Watson stat	4,58	
Prob (F-Stat.)	0,000			

$$\text{ect} = \text{inflation} + 2,52 * \text{National sukuk} - 13,17 * \text{Mudharabah} + 1,233 * \text{Musharakah} \\ + 6,17 * \text{interest rate} + 72,88 * \text{Intercept}$$

Source: Researcher's own computation, 2018 (Using Eviews 9).

From above empirical result, some diagnostic tests result is presented in below table to see some econometric problem.

Table 8. Diagnostic tests

item	test applied	CHSQ	Prob
Serial Correlation	Breusch-Godfrey Serial Correlation	0,152	0,00
Normality	Jarque-Bera	1,305	0,52
Functional form	Ramsey's RESET	0,012	0,99
Heteroscedasticity	Breusch-Pagan-Godfrey	0,402	0,371

Source: Researcher, 2018

Above result of diagnostic result shows that the model indicates autocorrelation problem. However, following Hasan and Nasir (2008), problem like autocorrelation is conflicting to normal distribution that has not been observed. Furthermore, there is no model specification error, and also there is no precence of heteroscedasticity in the model.

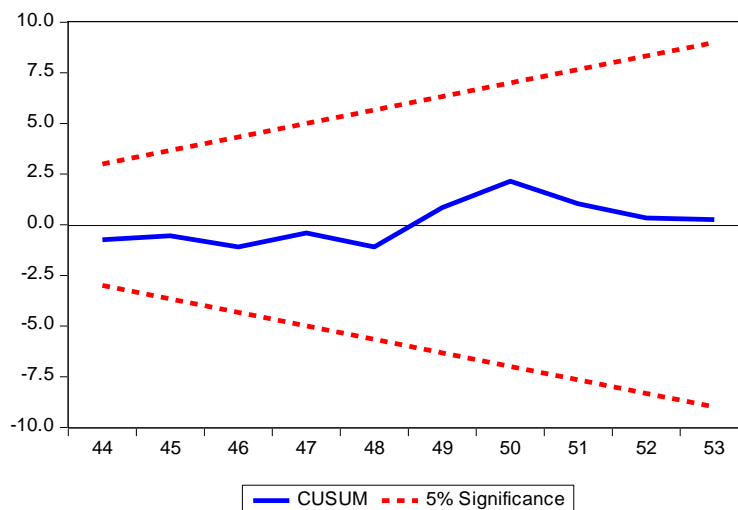
For the estimated result in Table 7, in the short run, the table above shows that error correction has the negative sign and significant at 1% level of significance, meaning that adjustment process of the disequilibrium in the short run will be fixed (eliminated) in the long run (Hasan and Nasir, 2008) for about 97%. Following Ariefianto (2012) to intrepret ECT coefficient, the disequilibrium in the short run will be fixed to the equilibrium in the long run for about 1,03 mounth (1/0,97).

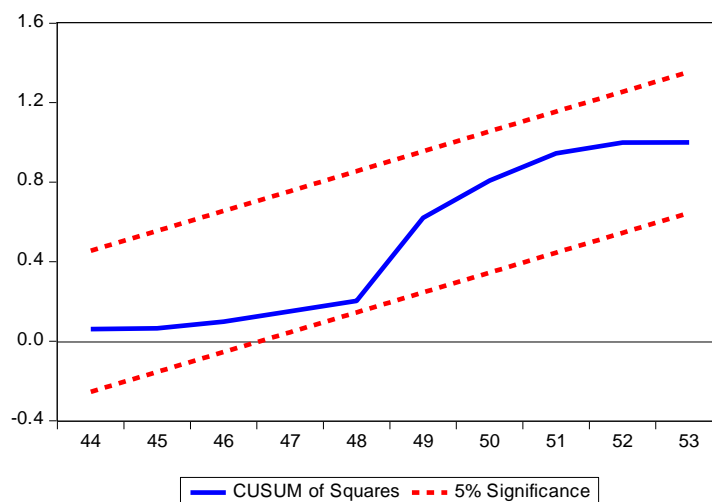
In the short run, PLS which is proxied by only *mudharabah* and *musharakah* can affect inflation. Based on sensitivity analysis, in the short run, only PLS proxied by *musharakah* can stabilise inflation rather than interest rate as coefficient value of *musharakah* is less than interest rate. In the long run, PLS proxied by national sukuk, and *mudharabah* can affect inflation and based on their sensitivity, only National sukuk that can be used to stabilise inflation since its coefficient is less than interest rate.

Therefore, based on the short-and long run coefficient, PLS that proxied by national sukuk can stabilise level of inflation in the long run only, but not in the short run. PLS that is proxied by *Musharakah* can stabilise inflation in the short run only but not in the long run. *Mudharabah*, eventhough significant both in the long run and short run, but its coefficient shows that the instrument is highly sensitive to inflation compared to interest rate, and cannot be used to stabilise inflation in the short run and long run.

4.5 Stability Test for Parameter

Furthermore, to test whether the regression coefficients are generally stable over the sample period (Omar, Hussin and Ali GH, 2015), Hasan and Nasir (2008) used CUSUM and CUSUMSQ plots. The plots are depicted as follow.





As depicted above, Hasan and Nasir (2008) explained that when CUSUM and CUSUMSQ are within the critical bounds of 5%, it indicates that the model is structurally stable. The result shows that CUSUM and CUSUMSQ are within the red line with 5% level of significance, meaning that the model is structurally stable.

5. Conclusion

This paper try to see the relationship between PLS and inflation that theoretically PLS can stabilise level of inflation rather than interest rate in Indonesia. Based on bound test, it can be concluded that PLS proxied by National sukuk, *mudharabah* and *musharakah* and interest rate simultaneously affect inflation in Indonesia. Based on coefficient value analysis, PLS that is proxied by national sukuk can stabilise level of inflation in the long run only, but not in the short run. *Musharakah* as other proxy of PLS can stabilise inflation in the short run only but not in the long run. However, *Mudharabah* cannot be used to stabilise inflation both the short run and long run. Based on this result, this paper suggests that Bank of Indonesia as the main authority to control inflation can utilise sukuk instrument to stabilise level of inflation rather than depends only on BI rate. Furthermore, for the further research, the hypothesis of PLS that can stabilise inflation can be proved by broaden the scope of data such as including some others Moslem majority countries and compare it with non-Moslem majority countries.

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Note

Note 1. Taken from detik finance online news (Indonesian language), see:

<https://finance.detik.com/berita-ekonomi-bisnis/d-4140819/bps-beberkan-angka-kemiskinan-dari-masa-ke-masa>