



# An Empirical Analysis of Islamic Banking (IBs) Contribution to Indonesia's Inclusive Growth<sup>1</sup>

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## Abstract

The research is aim to attest and assess empirically the contribution of Islamic banking (IBs) on the inclusive growth in Indonesia. By taking a trial-stage method i.e. descriptive analysis to elaborate a statistical data, autoregressive distributed lag (ARDL) model to assess empirically the contribution in a long-term, and error correction model (ECM) to assess the contribution in a short-term empirically. The findings are, total deposits and total financing only contribute positively significant into GDP and gini ratio in a long-term, that similiar with the previous study. Then, a total financing contribute negatively to all indicators of inclusive growth in a long-term, but, its only significance on GDP and gini ratio. But, it was contribute significantly to all indicators in a short-term. So. The findings was only evidence the significance contribution of IBs on inclusive growth in a short-term. Based on it, a long-term contribution of IBs still cathegorized as the area that requires an extentions in order to accomplish it.

**Keywords:** Islamic Banking (IBs), Inclusive Growth, Poverty, Empirical Analysis

**JEL Classification:** G18, G21, I31, I32, I38

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## I. Introduction

### 1.1. Background

Islamic banking was a financial institution that operates based on Islamic principles and it has grown massively in Indonesia since 1992 (Ismal, 2010; Al Nasser & Muhammed, 2013). By the average annual growth of assets which up to 51.11% since 2000-2010 and its still growin up (Ascarya, 2010). Recorded in June 2020, total assets of Islamic banking in Indonesia reached Rp356.33 trillion (OJK, 2020). Means, it was increased rapidly than June 2010 which only Rp78.14 trillion or it is equal to 456.015% in the past 10 years.

With that growth, Islamic banking should has contributed to Indonesian economic improvement and growth. As in other countries and it has been proven by a several studies.<sup>2</sup> And it was shown to has a contribution to GDP as noted in El Ayyubi, et al. (2017). However, it is not enough if the role of Islamic banking was only measured by GDP. Because the goals of Islam was not only an exclusive economy, but the inclusiveness or precisely is *falah* (prosperity) (Ismail & Shaikh, 2017). So, this analysis will takes an inclusive growth as a measurement of *falah*. Completing a GDP which cannot illustrated an economic dynamic exhaustively (Pietak, 2014).

Inclusive growth alone, officially adopted in Indonesia at 2010. Even though, the concept was only developed in 2004 by UNDP (United Nation Development Program). And currently, it was developed by international organizations (Kusumawati, Elhorst, & Haan, 2016). Wherein this concept, the economy is not only measure by GDP. But also measured by poverty, employment, and income distribution as formulated by world bank and IMF (Anand, Mishra, & Peiris, 2013; Kusumawati, et al., 2016). By measuring those instruments, the ideal condition in economy could be achieved. Because it is measuring the economy broadly as stated by Suryanarayana (2013). So, the concept in line with prosperity goals. Hence, inclusive growth is compatible to be used to measure an Islamic banking contribution on economy.

Therefore, the current research will analyze the contribution of Islamic banking (IBs) due to an economic through an inclusive growth. It is considered appropriate with an Islamic goals on economics. And this research is the complementation of a previous research, Abd.Majid & Kassim (2015). Which analyze a contribution of Islamic banking (IBs) to the country's economy, but only measured from GDP. While the current research has improved a measurement of country's economy by inclusive growth.

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<sup>2</sup> Al-Yousif (2002), Vaithilingam, et al. (2005), Habibullah & Eng (2006), Ibrahim (2007), Cordow, et al. (2011) and Abd.Majid & Kassim (2015).

Besides it, the current research is also aim to verify the statement of previous study with similiar topic, that is, Susilo (2015). Which stated that Islamic financial inclusion has no contribution to the inclusive growth in Indonesia, even thought it was not proven empirically. So, the current research will attest it empirically. But it will focus on Islamic banking (IBs) to narrow the discussion down and adapt it to the current research goals. In essence, the research will attest and assess the contribution of Islamic banking (IBs) to an inclusive growth in Indonesia through an empirical approach to accomplish a previous researchs at this topic.

## **1.2. Objectives**

The purposes of the research are to enriching the analysis and literature of Islamic finance and prosperity of growth which represented by an inclusive growth in case of Indonesia. And also to attest and assess the contribution of Islamic banking (IBs) to inclusive growth. By dual specific objectives, as follows;

*RO1: Analyzing a relationship between Islamic banking (IBs) and inclusive growth based on statistical data*

*RO2: Attesting and assessing a contribution of Islamic banking (IBs) to an inclusive growth in Indonesia*

## **II. Literature Review**

The research consist of a several theoretical background which associated to a financial literature topic. Specifically, involve with an Islamic banking (IBs) and Inclusive growth theory, as follows:

### **2.1. Islamic Banking (IBs) and The Indicators**

An analyzed Islamic banking (IBs) was an Indonesian Islamic banks. Then, to adjust it with an analytical goals, the indicators which will be used to measure it are total deposits and total financing of Islamic banking (IBs). Where the election of those instruments has adapted from a previous research, Abd.Majid & Kassim (2015). Although on the research, there are five indicators, that is total deposits, total financing, Islamic stock index, inflation in term of consumer price index, and export-import. But, the research analyze the Islamic banking and financial institutions (IBFIs). So, it was using five indicators to measure it. While, the current research was only focus to analyze the Islamic banking (IBs). So, the indicators which will be used at this analysis was only two, that is total deposits and total financing. And the election of the indicators has been reviewed be based on a several previous study.

Such as total deposits which was reinforced by Ayuniyyah, et al., (2013) and Zirek, et al., (2016) as an indicator of Islamic banking (IBs). Then also for a compability of total financing as the other indicator of Islamic banking (IBs) as proven in Dhaoui (2018). So, based on that reinforcement, it can be assumed that the instrument has compable to be an Islamic banking (IBs) indicators at this analysis. Furthermore, the research is not only presents an evidence of a compability of those indicators. But, it also provide a rationale of the elemination of the other indicators, apart from differences in research object.

The rationale of an indicators elimination rfrom a previous research was based on t he statement of a several study. As stated in Ayuniyyah, et al., (2013) that export-import and inflation has no correlation with Islamic banking (IBs). Then, for an Islamic stock market, although, it was proven that Islamic stock market has a correlation with Islamic banking (IBs), but when the instrument included as an indicator at this analysis. A discussion will not focus on Islamic banking (IBs) to the inclusive growth. So, to narrow down an analysis into Islamic banking (IBs). Then, the instruments will not included in the analysis. And by the indicators election and elimination, the research will be more efficient and appropriate with an objectives of a research.

## **2.2. Inclusive Growth and The Indicators**

Inclusive growth is an ideal wealth management concept which can measure an economy exhaustively (Lee, 2018). It is also called by shared growth, broad-based growth, or pro-poor growth (Suryanarayana, 2013). The concept was discussed by an international organizations and policy makers. But it was first developed by United Nations Development Program (UNDP) in 2004, and adopted by Indonesia in 2010 (Kusumawati, et al., 2016).

As an introduction, it will be briefly explained about inclusive growth. Felipe (2012) defines an inclusive growth as an ideal condition that can be achieved when all of society participate and contribute together. And the statement was similar with Anand, et al. (2013) which stated the inclusive growth uses all economic instruments to achieved it. Means, it is measure an economy exhaustively. And the overview of the concept has suggested by a several international organizations. Even though, there are still a disagreement of a measurement indicators of it. But a several instrument was planned as an indicators by an international organizations, as listed on a Table 1.

**Table 1.** Inclusive Growth Indicators

International Organizations	Indicators
World Bank	- Economic Growth - Poverty - Employment
ADB	- Economic Growth - Equal Opportunity - Broader Access for Participate - Stange Social Safety Nets
IMF	- Economic Growth - Income Distribution
EU Commission	- Economic Growth - Employment - Education - Poverty
UNDP	- Economic Growth - Equality on Income Distribution - Opportunity to Participate and have Benefir from Growth
OECD	- Economic Growth - Household Income - Health Status - Jobs

Based on table 1, there are plenty indicators which has proposed by different organizations. But, this analysis will uses an indicators for an inclusive growth which consider to world bank and IMF proposal. The election of the indicators with world bank and IMF proposal basis was because of an analytical topic. Where the research is about a financial literature, so, the reference that considered appropriate to be used at this analysis is a financial institutions or organizations. Therefore, the indicators of inclusive growth at this analysis are economic growth, poverty, employment, and income distribution. And each indicators has its own measurement.

At this analysis, the instrument which will be used to measure an economic growth is GDP. It is because GDP has been agreed internationally as a tool as measurement of an economic growth (Wesselink, et al., 2007; Haller, 2012; Edeme, 2018) Then, poverty indicators will be represented by a poverty rate. Because, it has been a standard to measure a poverty (Eberstadt, 2008). Apart from being a standard, a poverty rate was also proven illustrates the growth on income side (Akinbobola & Saibu, 2004). And the other indicator of inclusive growth is employment, which will be measured by unemployment rate. Then, the last indicator is an income distribution which basically intend to measure an inequality. So, the gini ratio will be used to

measure it (Catalano, et al., 2009). Where the compability of those instrument has been reinforced by a several research, that is Farris (2010), Brauningger (2002) and Onodugo, et al. (2017).

### **2.3. Previous Research**

The research was adapted and developed from Abd.Majid & Kassim (2015), which analyze the contribution of Islamic banking and financial institutions (IBFIs) on economic growth. But, the research was only use GDP as a sole indicator of growth. Even though, its not enough to measure an economic exhaustively (Pietak, 2014; Ivkovic, 2016). Therefore, an inclusive growth has been selected as an indicators to measure an economic condition at this analysis.

Besides it, there are several research which discuss a similiar topic with current research. That is, Doumbia (2008), which analyze the inclusive growth on good governance side. Lee (2008), although the study was only a qualitative research which use a descriptive analysis and literature method. Then Sengupta (2010) which states that inclusive growth was a solution to measure the economy in detail to equality problem. And the other research is Suryanarayana (2013) which analyze the inclusive growth in term of the wealth distribution, including a banking sector as a medium of distribution. But, the research was only uses a descriptive analysis. Means, the study was non-empirical analysis.

So as with the research of Susilo (2015) which analyze the effect of Islamic financial institution in alleviating a poverty. And states that Islamic financial inclusion (including Islamic banking) has no effect on poverty alleviation which is a part of inclusive growth But the statement still does not evidence empirically. Because the resaerch only use a literature study and a descriptive analysis. So, the current analysis is prepared to analyze the statement and evidence it empirically.

### **2.4. Conceptual Framework**

The Following is a conceptual framework which has arranged based on Polancic (2008) model. The framework contain an analyzed variables, indicators, measurement and methodology.

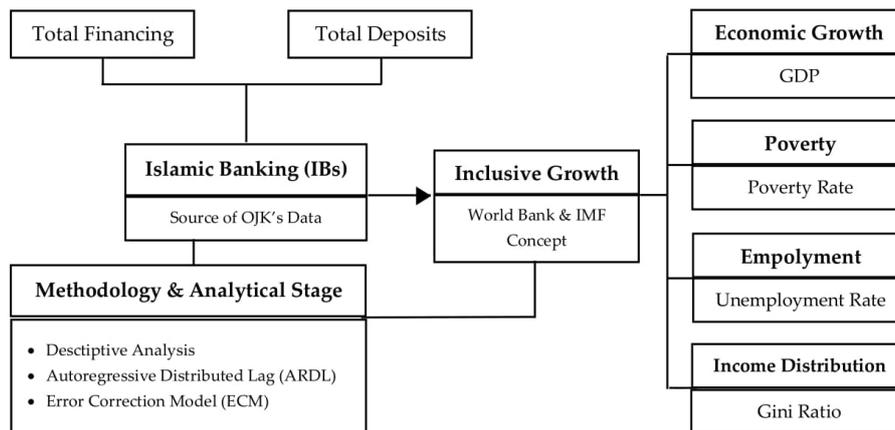


Figure 1. Conceptual Framework of Research

The research analyze the Islamic banking contribution to inclusive growth. Where, both of variables has its own indicators. Where Islamic banking explained by total deposits and total financing. While, the indicators of inclusive growth consist of GDP, poverty rate, unemployment rate, and gini ratio. Where the selection of the Islamic banking indicators refer to Abd.Majid & Kassim (2015) with some modification (election and elimination of indicators). And the inclusive growth indicators was quoted from world bank and IMF model proposal, and it is reinforced by Anand, et al. (2013), Kusumawati, et al., (2016) and Muhammad & David (2019) as a theoretical background.

### III. Methodology

#### 3.1. Research Data

The research will analyze the contribution of Islamic banking (IBs) on inclusive growth. So, a variable that will be analyzed are total deposits and total financing as an indicators of Islamic banking (IBs). And use a GDP, poverty rate, unemployment rate, and gini ratio as an indicators of inclusive growth. That Whose the data has been collected from reliable sources.

Where the data of total deposits and financing of Islamic banking has been collected from OJK's (financial services authority of Indonesia) website. While, a data of inclusive growth indicators has collected from the website of ministry of trade of Indonesia and central bureau of statistics Indonesia. Which arranged in time series form, starting from 2010 to 2019. But, a collected data still in annual, semiannual, or quarterly. So, in order to balance a data and facilitate an analysis, the data was interpolated into a mothly data based on polynomial approach. Its aim to estimate an intermediate value between a predertemined data points (Jia, 2017). But for

a data of GDP which applied manufacture production index as a proxy of that instrument. And balancing an analyzed time series data in the same time interval measure.

### 3.2. Indicators Description

Indicator description is described in table 2

Table 2. Indicators Description

Islamic Banking (IBs)		
Variable	Islamic Banking (IBs)	
Indicators	Deposits	Financing
Descriptions	For a bank, deposits was a key tools of a financing project. Which in practice is used as a financing capital by a bank (Onyema & Odeiem-Ogulu, 2019). And, in Islamic banking (IBs), deposits was divided into four scheme, that is <i>wadi'ah</i> (save keeping) deposit, <i>mudharabah</i> (profit sharing) deposit, <i>tawarruq</i> (benevolent) deposit, and <i>qard</i> (cost plus save) deposit (Aris, et al., 2013).	Financing is a provision of funds for a business project agreed by two parties. It causes one party to have obligations to the other for a certain period (Kasmir, 2005). And also can be applied personally or without institutional bacground (Rivai & Arifin, 2010). Where in Islamic banking (IBs), the it has been divided of two type based on the segment. Based on consumer segment, a financing was consist of four product. That is, house financing, personal financing, vehicle financing, and staff financing. Then, about a financing which based on corporate segment are consist of, trade financing, asset-based financing, and corporate investment (Aris, et al., 2013).

Inclusive Growth		
Variable	Inclusive Growth	
Indicators	Economic Growth	Poverty
Measurement	GDP	Poverty Rate
Descriptions	Economic growth was a complex phenomenon of a country that monitored from population, resources, infrastructure, and the management of government (Haller, 2012). And its usually measured by GDP, as a measure that has been recognized internationally (Edeme, 2018).	A poverty can be defined as a deficiency in wealth distribution by a government into a household. And the limitation of household's basic needs fulfillment (Mowafi & Khawaja, 2005). A poverty rate will be used to measure it (Goedhart, et al., 1977). And in Indonesia alone, a poverty line was measured based on basic needs approach (BPS, 2020).

Income Distribution		
Indicators	Employment	Income Distribution
Measurement	Unemployment Rate	Gini Ratio
Descriptions	The waste of resources which leads to a reduction in the prospect for a long-run growth and reduces a welfare of a country. Thus causing an expansion of fiscal costs for the government (Chowdhury & Zuk, 2018). Therefore, the government takes a measure to monitor unemployment in its territory. And use the unemployment rate as agreed by international organizations and the majority of countries (ILO, 2015).	Income distribution was an important instrument that influences a people's cohesion and iy also determines an inequality. When an income doesn't distribute equally, so, an inequality will be exist in a society (Stewart, 2000). Therefore, gini ratio will be used to measure it. Because, a gini ratio was an index which works to measure an equality of wealth distribution of a country. And served in statistical summary (Farris, 2010).

### 3.3. Model Development

This research is an adaptation and development of Abd.Majid & Kassim's (2015) research. By taking a similar topic, but narrowed it down to Islamic banking (IBs). While Abd.Majid & Kassim's (2015) was analyze an Islamic financial literature in a broader discussion, that is, Islamic banking and financial institutions (IBFIs). And another difference lies in a research geographical boundaries. Where a previous research takes Malaysia as a geographical boundaries, but, the current research takes Indonesia of its case.

Furthermore, there is a difference of an analytical object. Where it doesn't analyze the economic growth, but substitute it into inclusive growth as a measure of country's economic. It is intended as an improvement of a previous research. Because after a review, an economic growth was inappropriate to measure an economy based on Islamic economic goals. So, an inclusive growth has been selected as a measure of economy because it is in line with Islamic economic goals. And based on the reasonings, the research has been complied. With the aim, to analyze the contribution of Islamic banking as like as previous research, but on different object, that is, inclusive growth.

### 3.4. Method

In line with *RO* (research objectives), this research will use a mixed method. By combining a descriptive analysis methods as an application of qualitative approach. Then, an autoregressive distributed lag (ARDL) and error correction model (ECM) model as a tools of quantitative analysis. Means, the analysis use quad-stage method model. The first method i.e. descriptive analysis, works to answer *RO1* of the research. Then, ARDL and ECM will be used to answer *RO2*. But, before applying it, the methods will be briefly explained, as follows;

#### 3.4.1. Descriptive Analysis

Theoretically, descriptive analysis was a method which is used to describe a phenomenon of a research. And it was the most used in a research (Adams, Khan, & Raeside, 2007). Where the use is intended to elaborate a statistical data and composing an analytical assumption. And the data will be served in a substantive form (Hart, 1998; Ibrahim, et al., 2019). Consider to this explanation, the method is appropriate to use in answering *RO1*.

#### 3.4.2. Autoregressive Distributed Lag (ARDL) Model

Autoregressive distributed lag model or referred to as ARDL, was a method introduced by Pesaran & Shin (1995) (Hamzah & Handri, 2017), that is used

in a single equation of dynamic regression. And it has a work to analyze a time series data in a long-term econometrical approach (Hassler & Wolters, 2005). It was a method which compatible to estimate a co-integration of variables. It can capture a dynamic relationship of variables by the existence of lag. So, it will cause a flexibility on a different lag of variables in endogenous and exogenous variables. The model can also analyze the effect of exogenous variables on each lag in different time intervals (Zaretta & Yovita, 2019).

The method is applied to answer *RO2*, i.e. to attest and assess the contribution of Islamic banking (IBs) to inclusive growth. Therefore, its required an empirical method such as ARDL to answer it. But the use of ARDL was only ro evidence the contribution of analyzed variables in a long-term.

### **3.4.3. Error Correction Model (ECM)**

Error correction model (ECM) at this analysis has a work to accomplish an ARDL method in answer *RO2*. Where application of ECM will strenghtening the result of ARDL in answering *RO2*. ECM firstly introduced by Dennis Sargan in 1950, then popularized by Eangle-Granger (1987) (Alogoskoufis, 1991). And defined as a method which has a function to adjust an instrument and mantain it, in order to make a research get near to its desired result (Phillips, 1957). Which in practice, ECM imposes a linier homogeneity of researched variables (Pagan, 1985). So, the method will accomplish ARDL method. That in this analysis, ECM will use to assess the cointegration of variables in a short-term. Such as in (Tulak, Junaidi, & Utami, 2017).

### **3.5. Model Specification**

As explained above, the research will use ARDL and ECM to answer an empirical analysis of *RO2*. So, the formulation or model specification of the models is required. Therefore, this research has been provide it.

The first is ARDL model. But the research formulated the model based on Varquez et al. (2012). Its because a traditional model is considered inapplicable anymore. So, it requires an alternative model which can estimate an hypothetical procudure maximally (Johansen, 1992). Therefore, a developed model of ARDL by Varquez et al. (2012) has been selected to formulate a research hypothesis of ARDL at this research. And the following are the model;

$$LINC^{i,t} = \alpha + \sum_{j=1}^{p1} \beta_{i,j} LGDP_{i=t,j} + \sum_{j=2}^{p2} \beta_{i,j} LPR_{i=t,j} + \sum_{j=3}^{p3} \beta_{i,j} LUR_{i=t,j} + \sum_{j=4}^{p4} \beta_{i,j} LGR_{i=t,j} + \sum_{j=0}^{q1} \phi_{1j} \ln TD_{t-j} + \sum_{j=0}^{q2} \phi_{2j} \ln TF_{t-j} \dots (1)$$

By a several specifications, as follows;

$$LGDP^{i,t} = \alpha + \sum_{j=1}^{p1} \beta_{i,j} LGDP_{i=t,j} + \sum_{j=0}^{q1} \phi_{1j} \ln TD_{t-j} + \sum_{j=0}^{q2} \phi_{2j} \ln TF_{t-j} \dots (2)$$

$$LPR^{i,t} = \alpha + \sum_{j=1}^{p2} \beta_{i,j} LPR_{i=t,j} + \sum_{j=0}^{q1} \phi_{1j} \ln TD_{t-j} + \sum_{j=0}^{q2} \phi_{2j} \ln TF_{t-j} \dots (3)$$

$$LUR^{i,t} = \alpha + \sum_{j=1}^{p3} \beta_{i,j} LUR_{i=t,j} + \sum_{j=0}^{q1} \phi_{1j} \ln TD_{t-j} + \sum_{j=0}^{q2} \phi_{2j} \ln TF_{t-j} \dots (4)$$

$$LGR^{i,t} = \alpha + \sum_{j=1}^{p4} \beta_{i,j} LGR_{i=t,j} + \sum_{j=0}^{q1} \phi_{1j} \ln TD_{t-j} + \sum_{j=0}^{q2} \phi_{2j} \ln TF_{t-j} \dots (5)$$

Where;

$$LINC_{i,t} = \text{Natural Logarithm of Inclusive Growth as measured by GDP, poverty rate, unemployment rate, and gini ratio } LINC_{i,t} = \ln \left[ \frac{INC_{i,t}}{1 - INC_{i,t}} \right]$$

$$LGDP_{i,t-j} = \text{Natural Logarithm of GDP}$$

$$LPR_{i,t-j} = \text{Natural Logarithm of Poverty Rate}$$

$$LUR_{i,t-j} = \text{Natural Logarithm of Unemployment Rate}$$

$$LGR_{i,t-j} = \text{Natural Logarithm of Gini Ratio}$$

$$\ln TD_{t-j} = \text{Natural Logarithm of Total Deposits of Islamic Banking}$$

$$\ln TF_{t-j} = \text{Natural Logarithm of Total Financing of Islamic Banking}$$

Then, the cointegration of each exogenous variables would be determined in a long term and short term, and the representative variables of inclusive growth added up by the value of estimation coefficient ( $\phi_i$ ) of each the exogenous variables. Then the chain rules would be used to determine the cointegration of the shock of each exogenous variables due to untransformed GDP, poverty rate, unemployment rate, and gini ratio which would be evaluated by the sample of inclusive growth's average. Then, after an ARDL estimation, the model will be estimate by ECM method with a model specification as follows;

Short term effect;

$$\frac{\Delta INC_i}{\Delta X_{inc}} = INC_i \times (1 - \overline{INC}_i) \times \sum_{k,t-j} \phi_{k,t-j} \dots (6)$$

Where;

$$(\phi_i) = \text{Estimated value of exogenous variables coefficient}$$

$$X_{inc} = \text{Way of exogenous variables cointegrate inclusive growth}$$

$$INC = \text{Endogenous Variables; Inclusive growth}$$

By following elaboration, that is,  $X_{inc}$  means, how the exogenous variables (Islamic banking (IBs) variable and its indicators) cointegrate INC (Inclusive Growth variable and its indicators) which classified in the average of the average of inclusive growth to  $i$  in observation.

### 3.6. Stage of Analysis

Regarding to the explanation above, the research uses mixed method which consist of trial-stage method model. By the following stages sequence;

- 1) Descriptive analysis that works to elaborate a statistical data and composing an analytical assumption. And to answer *RO1*.
- 2) Unit root test, to seek a constancy of data's mean and variant of each lags (Gujarati, 2003). And it will be tested based on Augmented Dickey Fuller (ADF) test and the automatic lag will be selected by Schwartz Information Criterion (SIC) approach.
- 3) Lag determination, an important stage to seek the best model of ARDL (Bahmani-Oskooee & Bohl, 2000). The test will apply F-bound test of ARDL long bound testing.
- 4) Breusch-Godfrey serial correlation LM Test, to ensure that there are no violations of econometric principles by the selected model and test the suitability of the model that has been selected to be estimated at a later stage.
- 5) Autoregressive distributed lag (ARDL) model test, to attest and assess the cointegration between Islamic banking (IBs) and inclusive growth in a long-term. (To answer *RO2*)
- 6) Error correction model (ECM), to attest and assess the cointegration between Islamic banking (IBs) and inclusive growth in a short-term. (To answer *RO2*)

## IV. Results and Analysis

### 4.1. Statistical Description

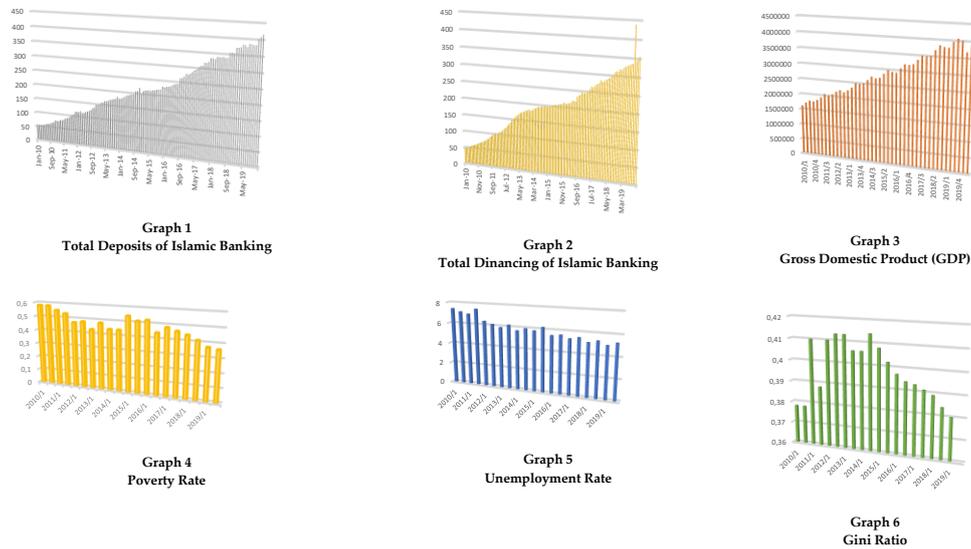


Figure 2. Graphics of Research Data

Source: OJK's website and processed by researcher

Figure 2 shows a statistical condition of the data. Where a graph 1 and graph 2 represent the growth of total deposits and total financing of Islamic banking (IBs). And statistically, the graph shows an excellent growth of IBs indicators. That is, the growth are progressive with percentage of growth of 180.2% in total deposits and 166,8% in total financing since December 2015 to December 2019.

As it increases, a data of GDP is also show a fairly steady increase as presented on a graph 3. Which of the same time interval, GDP has increase of 136.7%. With annual growth average of 108,4% since 2015.<sup>3</sup> But, the other indicators has a contrary trend of the growth. Where the trend is a decrease, as shown in graph 4, 5, and 6. Although, a graph 6 as an illustration of gini ratio condition has a volatile decrease. But overall, gini ratio decreased steadily sence 2015. As like as poverty rate and unemployment rate that was shown by graph 4 and graph 5.<sup>4</sup>

Based on those explanation, it can be concluded that a data of IBs indicators increases as like as GDP. Along with it, a poverty rate, unemployment rate, and gini ratio has decreased. So, the movement of data in the graph shows a relationships that can be an assumption of the research. And those statistical data indicate a several assumption of the analysis, that is; *Islamic banking*

<sup>3</sup> Data sourced from Ministry of Trade website and processed by researcher

<sup>4</sup> Data sourced from Central Bureau of statistics.

(IBs) has a positive relation with GDP. And vice versa on poverty rate, unemployment rate, and gini ratio. But, the assumption doesn't valid yet. And it requires an evidence by an empirical analysis. So, to clarify the assumption, this research will analyze the relations of those variables empirically. And the analysis will applied triple-stage model of empirical method, that is, ARDL and ECM as stated in a further discussion.

#### 4.2. Econometrical Result

This econometrical estimation is aim to answer RO2 by estimate the model specifications, which consist of ARDL and ECM models. But before it, there are a several testing prerequisites that need to be met. Firstly, it is started from stationary test by unit root test. The test works to determine whether the data are stationary or should be differenced to render it (Hatanaka, 1995). Where in this analysis, this estimation is applied augmented Dickey-Fuller (ADF) test by Schwartz information criterion (SIC). Augmented Dickey-Fuller (ADF) test estimates the hypothesis of time series data in against the alternatives (I(0) to I(1)) (Said & Dickey, 1984; Elliot, et al., 1996). And SIC has selected because SIC is the best approach to reflect a consistency of ARDL model (Pesaran & Shin, 1995).

Table 3. Unit Root Test

Level	LNTD	LNTF	LNGDP	LNPR	LNUR	LNGR
ADF Test Statistic	-3.914	-5.265	11.208	-1.687	-1.347	-0.851
1st difference	LNTD	LNTF	LNGDP	LNPR	LNUR	LNGR
ADF Test Statistic	-4.472	-15.478	-7.314	-2.382	-7.286	-1.776
2nd difference	LNTD	LNTF	LNGDP	LNPR	LNUR	LNGR
ADF Test Statistic	-7.936	-8.617	-10.189	-10.489	-7.718	-9.854
Test Critical Value	1% level			-3.486551		
	5% level			-2.886074		
	10% level			-2.579931		

Table 3 show that the variables has a unit root at level and 1st difference. So, it is requires the other differentiation of a stanionary test. It is causing the election of 2nd difference of stationarity. And the finding show that the data become stationary of 2nd difference. It is shown by ADF test statistic value which < test critical value of all level significantions (Elliot, et al., 1996). Means, the data has met the requirement to estimate by ARDL and ECM (Alogoskoufis, 1991; Pesaran & Shin, 1995). After finds the stationarity, then, the lag testing by F-bound test will be applied to seek a best model of ARDL. The following are the results;

**Table 4.** Lag Determination

Signif.	<i>I(0)</i>	<i>I(1)</i>	Lag Length	Computed F-Statistics			
	Asymptotic: n=1000			LNGDP	LNPR	LNUR	LNGR
10%	2.63	3.35	<b>1 (1,1,1)</b>	14.98285	3.726793	2.093083	6.924682
5%	3.1	3.87	<b>2 (2,2,2)</b>	7.478574	2.140897	3.416080	4.449665
2,50%	3.55	4.38	<b>3 (3,3,3)</b>	4.904855	1.918977	4.757787	3.364842
1%	4.13	5	<b>4 (4,4,4)</b>	5.377741	1.932132	5.827458	3.203494

Consider to table 4, it can be known that the findings are varies on a significance levels. But majority of model are significant on lag length 3. In detail, LNGDP was significance on lag length 3 in 1% level significance. LNPR was significance on lag length 1 with 2,5% and 5% level significance. LNUR was significance of lag lengths 2 and 3 on all significance levels but 10%. And the last model is LNGR, that significance on all lag lengths but 1, in 1% and 5% levels significance. So, based on it, the lag length 1 and 3 has been selected to estimate the equation (1), that was divided into 4 equation models (2, 3, 4, and 5). Because, the lag length was the highest significance model of F-Statistics. Which specifically, lag length 3 was used to estimate an model 2, 4, and 5. While, the lag length 1 is works to estimate an equation model 3.

When the hughest significance of lag lengths has been found, the estimation will be continued to long run co-integration test by ARDL. But to ensure the result, the autocorrelation test is required. So, at this stage, Breush-Godfrey serial correlation LM test. it is aim to ensure that there are no violations of econometric principles by the selected model and test the suitability of the model that has been selected to be estimated at a later stage. In short, it is used to seek the autocorrelation problem of a data. The result is described on Table 5.

**Table 5.** Breush-Godfrey serial correlation LM test

LNGDP			LNPR		
Breusch-Godfrey Serial Correlation LM Test:			Breusch-Godfrey Serial Correlation LM Test:		
F-statistic 2.260935 Prob. F(3,102) 0.0859			F-statistic 1.278748 Prob. F(3,102) 0.2857		
Obs*R-squared 7.295163 Square(3) 0.0631			Obs*R-squared 4.240895 Square(3) 0.2366		
LNUR			LNGR		
Breusch-Godfrey Serial Correlation LM Test:			Breusch-Godfrey Serial Correlation LM Test:		
F-statistic 0.775215 Prob. F(3,102) 0.5105			F-statistic 0.771925 F(3,102) 0.5123		
Obs*R-squared 2.608185 Square(3) 0.4561			Obs*R-squared 2.597362 Square(3) 0.4580		

**Table 6.** Long-Run Form of ARDL model

	LNGDP (3,3,3)		LNPR (1,1,1)		LNUR (3,3,3)		LNGR (3,3,3)	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
LNTD	1.208674	0.0000	-26.76932	0.8646	-0.086862	0.4785	-0.307593	0.0014
LNTF	-0.821624	0.0000	28.27025	0.8646	-0.128297	0.3243	0.298745	0.0036
C	5.870713	0.0000	-7.622406	0.8646	0.097103	0.0000	-0.861864	0.0000

**Table 7.** Error Correction Model Test Result

	LNGDP (3,3,3)	LNPR (1,1,1)	LNUR (3,3,3)	LNGR (3,3,3)
CointEq(-1)	-0.069720	-0.002629	-0.124950	-0.044565
Prob	0.0000	0.0002	0.0000	0.0003

The result of Breush-Godfrey serial correlation LM test indicates that the data has no autocorrelation because the value of prob.chi-square > test critical value of 5%. Therefore, the requirements for ARDL test has been met. The analysis can be continued to the ARDL test stage. The result is described on Table 6.

Based on table 6, it was found that LNTD and LNTF has a significant cointegration to LNGDP (3,3,3) and LNGR (3,3,3) in a long-term, but not to LNPR (1,1,1) and LNUR (3,3,3). With the following specifications; LNTD has a positive cointegration to LNGDP, LNPR, and LNGR, but vice versa on LNUR. Then, LNTF has a negative cointegration to all of models (LNGDP, LNPR, LNUR, LNGR) in a long-run. Then, to find the short-run cointegration which has been formulated in equation model (6). And the models will be estimated by error correction model. The ECM result estimation has served in Table 7.

Previously, the long-term cointegration has been interpreted by ARDL model. So, at this analysis, the short-term cointegration will be interpreted by ECM as served in table 7. The findings shows there is a significant short-term cointegration of variables. Interpreted by CointEq(-1) and Prob value that < critical value of 5%. Based on the result, it can be concluded that LNTD and LNTF cointegrate significantly to LNGDP (3.3.3), LNPR (1,1,1), LNUR (3,3,3), and LNUR (3,3,3) in a short-term. Then the findings will be reinforced by a robust test as a last stage of this empirical analysis.

### 4.3. Analysis

The findings shows the relationship of variables by a several specifications. That are, the relationship that provide the contribution of Islamic banking (IBs) indicators to an inclusive growth indicators. Where in a long-term, total deposits of Islamic banking has a positive contribution to GDP, poverty rate, and gini ratio. And contribute negatively to unemployment rate. While, total

financing of Islamic banking (IBs) contribute negatively into all of inclusive growth indicators. But those indicators was only significant on GDP and gini ratio as represented in table 6 above.

Then, table 7 has served the result of the Islamic banking (IBs) contribution to an inclusive growth indicators in a short-term. And the findings evidence that Islamic banking (IBs) has contribute significantly on an inclusive growth in a short-term. It is led the raise of GDP, the decrease of poverty rate and gini ratio by the Islamic financing of IBs, and the decline of unemployment rate when a total deposits and financing of IBs increase. Means, IBs was contribute significantly in achieve the goals of inclusive growth. And it was parallel with a research assumption of statistical description, but only in a short-term.

While in a long-term, the increase of total deposits of IBs causes the GDP increase. But it also causes the increase of poverty rate and gini ratio. Even though, IBs's total deposits decreases an unemployment rate. Then, a poverty rate, unemployment rate, and gini ratio will decrease when total financing of IBs increase. But it is only significance on gini ratio in a long-term relationship. So, in a long-term case, it can be concluded that Islamic banking indicators was only contribute significantly to GDP and gini ratio, and not to the other inclusive growth indicators. Means, the statements was answered the RO2, but it can't fulfill the assumption of statistical description of the research.

## **V. Conclusion and Recommendation**

### **5.1. Conclusion**

The research empirically explores the contribution of Islamic banking (IBs) to an inclusive growth in a long-term and short-term. By taking a case on Indonesia since 2010 to 2019. The analysis applies a trial-stage method to answer the objectives. The methods are a descriptive analysis to describe a statistical data, ARDL to answer the contribution in a long-term, and ECM to answer the contribution in a short-term. Based on those methods, the research finds a robust conclusion.

The conclusion is, a total deposits has a significant positive contribution on gini ratio in a long-term. An increase of poverty caused by an increase of total deposits can be assumed as wealth accumulation. So that the money can't circulate inclusively among a society. When a total deposits increase without being followed by the allocation of a maximum and inclusive distribution of financing causes money to circulate in one place and can't touch another class of society, thus causing an increase in the poverty rate. Then, a total financing contribute negatively on it. So, it can't be fulfill the assumption of statistical description. Even though, a total financing also

evidenced contribute negatively on poverty and unemployment rate, but the contribution is insignificant.

Whereas, in a short-term, IBs has evidence to has a relationship with inclusive growth. And the relationship or contribution are significance. In this case, the findings of a short-term estimation was in line with a research assumption and a previous research, Abd.Majid & Kassim in term of GDP. While, in a poverty, unemployment, and gini ratio context, the result has rejected the statement of Susilo (2015), when it compared by the result in a short-term. But the rejection wasn't valid in a long-term analytical result. So, as a closing conclusion, IBs has contribute significantly on inclusive growth in a short-term, but it doesn't roundly applies in a long-term.

## **5.2. Recommendation**

The findings of this analysis was only evidence the significance contribution of IBs on inclusive growth in a short-term. Based on it, a long-term contribution of IBs still categorized as the area that requires an extensions in order to accomplish it. And it is consider to refining this analytical literature. Specifically, consider to the findings on total financing, to upgrade the contribution of IBs on poverty and unemployment in a long-term, IBs is requires to develop a program that focus on society's economical improvement and refinement. It can be attained properly if IBs has its own Islamic social finance institutions. Where, IBs has an authority to manage its own ZISWAF funds. Therefore, an empowerment and improvement program by IBs will be more focused. Besides it, practically and theoritically, zakat, infak, and shodaqoh was focus on a poverty and economic equality. Moreover when it is applied in IBs which has a large total deposits and a complete of customer data. So, the practice of Islamic social funds management will be implemented maximally through of IBs. By its condition, it will be easier to achieve an inclusive growth in Indonesia. And it is an efficient recommendation to upgrade the contribution of IBs in achieve the goals of inclusive growth in Indonesia at this time. Therefore, The government needs to issue a policy to realize it. So that the banks has the authority to implement this program to support inclusive economic growth in Indonesia.

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## Appendix

### Attachment 1 Unit Root Test

Level	LNTD	LNTF	LNGDP	LNPR	LNUR	LNGR
<b>ADF Test Statistic</b>	-3.914	-5.265	-11.208	-1.687	-1.347	-0.851
<b>1st difference</b>	<b>LNTD</b>	<b>LNTF</b>	<b>LNGDP</b>	<b>LNPR</b>	<b>LNUR</b>	<b>LNGR</b>
<b>ADF Test Statistic</b>	-4.472	-15.478	-7.314	-2.382	-7.286	-1.776
<b>2nd difference</b>	<b>LNTD</b>	<b>LNTF</b>	<b>LNGDP</b>	<b>LNPR</b>	<b>LNUR</b>	<b>LNGR</b>
<b>ADF Test Statistic</b>	-7.936	-8.617	-7.098	-10.489	-7.718	-9.854
<i>Test Critical Value</i>	1% level		-3.486551			
	5% level		-2.886074			
	10% level		-2.579931			

Level					
Null Hypothesis: LNTD has a unit root Exogenous: Constant Lag Length: 1 (Automatic - based on SIC, maxlag=12)			Null Hypothesis: LNTF has a unit root Exogenous: Constant Lag Length: 2 (Automatic - based on SIC, maxlag=12)		
		t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic		-3.914580	0.0026	Augmented Dickey-Fuller test statistic	
Test critical values:	1% level	-3.486551		Test critical values:	1% level
	5% level	-2.886074			5% level
	10% level	-2.579931			10% level
*MacKinnon (1996) one-sided p-values.			*MacKinnon (1996) one-sided p-values.		
Null Hypothesis: LNGDP has a unit root Exogenous: Constant Lag Length: 2 (Automatic - based on SIC, maxlag=12)			Null Hypothesis: LNPR has a unit root Exogenous: Constant Lag Length: 7 (Automatic - based on SIC, maxlag=12)		
		t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic		-11.20885	0.0000	Augmented Dickey-Fuller test statistic	
Test critical values:	1% level			Test critical values:	1% level
	5% level				5% level
	10% level				10% level
*MacKinnon (1996) one-sided p-values.			*MacKinnon (1996) one-sided p-values.		
Null Hypothesis: LNUR has a unit root Exogenous: Constant Lag Length: 6 (Automatic - based on SIC, maxlag=12)			Null Hypothesis: LNGR has a unit root Exogenous: Constant Lag Length: 7 (Automatic - based on SIC, maxlag=12)		
		t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic		-1.687943	0.4346	Augmented Dickey-Fuller test statistic	
Test critical values:	1% level	-3.489659		Test critical values:	1% level
	5% level	-2.887425			5% level
	10% level	-2.580651			10% level
*MacKinnon (1996) one-sided p-values.			*MacKinnon (1996) one-sided p-values.		

<hr/> <hr/> Augmented Dickey-Fuller test statistic      -1.347866      0.6052 <hr/> Test critical      1% values:      level      -3.489117 5% level      -2.887190 10% level      -2.580525 <hr/> <hr/> *MacKinnon (1996) one-sided p-values.	<hr/> <hr/> Augmented Dickey-Fuller test statistic      -0.851480      0.8000 <hr/> Test critical      1% values:      level      -3.489659 5% level      -2.887425 10% level      -2.580651 <hr/> <hr/> *MacKinnon (1996) one-sided p-values.																																																
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Attachment 2 Lag Determination

Signif.	I(0)	I(1)	Lag Length	Computed F-Statistics			
	Asymptotic: n=1000			LNGDP	LNPR	LNUR	LNGR
10%	2.63	3.35	1 (1,1,1)	14.98285	3.726793	2.093083	6.924682
5%	3.1	3.87	2 (2,2,2)	7.478574	2.140897	3.416080	4.449665
2,50%	3.55	4.38	3 (3,3,3)	4.904855	1.918977	4.757787	3.364842
1%	4.13	5	4 (4,4,4)	5.377741	1.932132	5.827458	3.203494

Lngdp									
F-Bounds Test Lag 1					F-Bounds Test Lag 2				
Null Hypothesis: No levels relationship					Null Hypothesis: No levels relationship				
Asymptotic: n=1000					Asymptotic: n=1000				
Test	Statistic	Value	Signif.	I(0) I(1)	Test	Statistic	Value	Signif.	I(0) I(1)
F-statistic	14.98285	10%	2.63	3.35	F-statistic	7.478574	10%	2.63	3.35
K	2	5%	3.1	3.87	k	2	5%	3.1	3.87
		2.5%	3.55	4.38			2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5
F-Bounds Test Lag 3					F-Bounds Test Lag 4				
Null Hypothesis: No levels relationship					Null Hypothesis: No levels relationship				
Asymptotic: n=1000					Asymptotic: n=1000				
Test	Statistic	Value	Signif.	I(0) I(1)	Test	Statistic	Value	Signif.	I(0) I(1)
F-statistic	4.904855	10%	2.63	3.35	F-statistic	5.377741	10%	2.63	3.35
k	2	5%	3.1	3.87	k	2	5%	3.1	3.87
		2.5%	3.55	4.38			2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5
Lnpr									
F-Bounds Test Lag 1					F-Bounds Test Lag 2				
Null Hypothesis: No levels relationship					Null Hypothesis: No levels relationship				
Asymptotic: n=1000					Asymptotic: n=1000				
Test	Statistic	Value	Signif.	I(0) I(1)	Test	Statistic	Value	Signif.	I(0) I(1)
F-statistic	3.726793	10%	2.63	3.35	F-statistic	2.140897	10%	2.63	3.35
k	2	5%	3.1	3.87	k	2	5%	3.1	3.87
		2.5%	3.55	4.38			2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5
F-Bounds Test Lag 3					F-Bounds Test Lag 4				
Null Hypothesis: No levels relationship					Null Hypothesis: No levels relationship				
Asymptotic: n=1000					Asymptotic: n=1000				
Test	Statistic	Value	Signif.	I(0) I(1)	Test	Statistic	Value	Signif.	I(0) I(1)
F-statistic	1.918977	10%	2.63	3.35	F-statistic	1.932132	10%	2.63	3.35
k	2	5%	3.1	3.87	k	2	5%	3.1	3.87

2.5%					3.55 4.38					2.5%					3.55 4.38				
1%					4.13 5					1%					4.13 5				
<b>Lnur</b>																			
F-Bounds Test Lag 1										F-Bounds Test Lag 2									
Null Hypothesis: No levels relationship										Null Hypothesis: No levels relationship									
Test					Asymptotic: n=1000					Test					Asymptotic: n=1000				
Statistic	Value	Signif.	I(0)	I(1)	F-statistic	2.093083	10%	2.63	3.35	Statistic	Value	Signif.	I(0)	I(1)	F-statistic	3.416080	10%	2.63	3.35
	2	5%	3.1	3.87	k		2.5%	3.55	4.38		2	5%	3.1	3.87	k		2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5			1%	4.13	5			1%	4.13	5
F-Bounds Test Lag 3										F-Bounds Test Lag 4									
Null Hypothesis: No levels relationship										Null Hypothesis: No levels relationship									
Test					Asymptotic: n=1000					Test					Asymptotic: n=1000				
Statistic	Value	Signif.	I(0)	I(1)	F-statistic	4.757787	10%	2.63	3.35	Statistic	Value	Signif.	I(0)	I(1)	F-statistic	5.827458	10%	2.63	3.35
	2	5%	3.1	3.87	k		2.5%	3.55	4.38		2	5%	3.1	3.87	k		2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5			1%	4.13	5			1%	4.13	5
<b>Lngr</b>																			
F-Bounds Test Lag 1										F-Bounds Test Lag 2									
Null Hypothesis: No levels relationship										Null Hypothesis: No levels relationship									
Test					Asymptotic: n=1000					Test					Asymptotic: n=1000				
Statistic	Value	Signif.	I(0)	I(1)	F-statistic	6.924682	10%	2.63	3.35	Statistic	Value	Signif.	I(0)	I(1)	F-statistic	4.449665	10%	2.63	3.35
	2	5%	3.1	3.87	k		2.5%	3.55	4.38		2	5%	3.1	3.87	k		2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5			1%	4.13	5			1%	4.13	5
F-Bounds Test Lag 3										F-Bounds Test Lag 4									
Null Hypothesis: No levels relationship										Null Hypothesis: No levels relationship									
Test					Asymptotic: n=1000					Test					Asymptotic: n=1000				
Statistic	Value	Signif.	I(0)	I(1)	F-statistic	3.364842	10%	2.63	3.35	Statistic	Value	Signif.	I(0)	I(1)	F-statistic	3.203494	10%	2.63	3.35
	2	5%	3.1	3.87	k		2.5%	3.55	4.38		2	5%	3.1	3.87	k		2.5%	3.55	4.38
		1%	4.13	5			1%	4.13	5			1%	4.13	5			1%	4.13	5

*Attachment 3* *BLGM Test Result*

<b>LNGDP</b>				<b>LNPR</b>			
Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
<hr/> <hr/>				<hr/> <hr/>			
F-				F-			
statistic	2.260935	Prob. F(3,102)	0.0859	statistic	1.278748	Prob. F(3,102)	0.2857
Obs*R-				Obs*R-			
squared	7.295163	Prob. Chi-Square(3)	0.0631	squared	4.240895	Prob. Chi-Square(3)	0.2366
<hr/> <hr/>				<hr/> <hr/>			
<b>LNUR</b>				<b>LNGR</b>			
Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
<hr/> <hr/>				<hr/> <hr/>			
F-				F-			
statistic	0.775215	Prob. F(3,102)	0.5105	statistic	0.771925	Prob. F(3,102)	0.5123
Obs*R-				Obs*R-			
squared	2.608185	Prob. Chi-Square(3)	0.4561	squared	2.597362	Prob. Chi-Square(3)	0.4580
<hr/> <hr/>				<hr/> <hr/>			

Attachment 4 Long Run Form and Bound Test

	LNGDP		LNPR		LNUR		LNGR	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
LNTD	1.754424	0.4202	-26.76932	0.8646	-0.086862	0.4785	-0.307593	0.0014
LNTF	-1.563738	0.4460	28.27025	0.8646	-0.128297	0.3243	0.298745	0.0036
C	-0.474859	0.7705	-7.622406	0.8646	0.097103	0.0000	-0.861864	0.0000

<p>ARDL Long Run Form and Bounds Test                      Dependent Variable: D(LNGDP)                      Selected Model: ARDL(3, 3, 3)                      Case 2: Restricted Constant and No Trend                      Date: 20/09/20 Time: 08:16                      Sample: 2010M01 2019M12                      Included observations: 117</p> <hr/> <p style="text-align: center;">Conditional Error Correction Regression</p> <hr/> <table border="1"> <thead> <tr> <th>Variable</th> <th>Coefficient</th> <th>Std. Error</th> <th>t-Statistic</th> <th>Prob.</th> </tr> </thead> <tbody> <tr><td>C</td><td>0.409306</td><td>0.098830</td><td>4.141503</td><td>0.0001</td></tr> <tr><td>LNGDP(-1)*</td><td>-0.069720</td><td>0.017404</td><td>-4.006034</td><td>0.0001</td></tr> <tr><td>LNTD(-1)</td><td>0.084269</td><td>0.022815</td><td>3.693486</td><td>0.0004</td></tr> <tr><td>LNTF(-1)</td><td>-0.057284</td><td>0.017260</td><td>-3.318855</td><td>0.0012</td></tr> <tr><td>D(LNGDP(-1))</td><td>0.736592</td><td>0.092560</td><td>7.957952</td><td>0.0000</td></tr> <tr><td>D(LNGDP(-2))</td><td>-0.045390</td><td>0.097630</td><td>-0.464923</td><td>0.6429</td></tr> <tr><td>D(LNTD)</td><td>0.023630</td><td>0.028943</td><td>0.816427</td><td>0.4161</td></tr> <tr><td>D(LNTD(-1))</td><td>-0.076626</td><td>0.030286</td><td>-2.530073</td><td>0.0129</td></tr> <tr><td>D(LNTD(-2))</td><td>-0.000940</td><td>0.027984</td><td>-0.033573</td><td>0.9733</td></tr> <tr><td>D(LNTF)</td><td>-0.020204</td><td>0.019709</td><td>-1.025116</td><td>0.3077</td></tr> <tr><td>D(LNTF(-1))</td><td>0.028275</td><td>0.023511</td><td>1.202619</td><td>0.2318</td></tr> <tr><td>D(LNTF(-2))</td><td>0.009717</td><td>0.020096</td><td>0.483535</td><td>0.6297</td></tr> </tbody> </table> <p>* p-value incompatible with t-Bounds distribution.</p> <hr/> <p style="text-align: center;">Levels Equation</p> <p style="text-align: center;">Case 2: Restricted Constant and No Trend</p> <hr/> <table border="1"> <thead> <tr> <th>Variable</th> <th>Coefficient</th> <th>Std. 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C	0.409306	0.098830	4.141503	0.0001	LNGDP(-1)*	-0.069720	0.017404	-4.006034	0.0001	LNTD(-1)	0.084269	0.022815	3.693486	0.0004	LNTF(-1)	-0.057284	0.017260	-3.318855	0.0012	D(LNGDP(-1))	0.736592	0.092560	7.957952	0.0000	D(LNGDP(-2))	-0.045390	0.097630	-0.464923	0.6429	D(LNTD)	0.023630	0.028943	0.816427	0.4161	D(LNTD(-1))	-0.076626	0.030286	-2.530073	0.0129	D(LNTD(-2))	-0.000940	0.027984	-0.033573	0.9733	D(LNTF)	-0.020204	0.019709	-1.025116	0.3077	D(LNTF(-1))	0.028275	0.023511	1.202619	0.2318	D(LNTF(-2))	0.009717	0.020096	0.483535	0.6297	Variable	Coefficient	Std. Error	t-Statistic	Prob.	LNTD	1.754424	0.160304	7.539909	0.0000	LNTF	-1.563738	0.171570	-4.788861	0.0000	C	-0.474859	0.149479	39.27437	0.0000	<p>ARDL Long Run Form and Bounds Test                      Dependent Variable: D(LNPR)                      Selected Model: ARDL(1, 1, 1)                      Case 2: Restricted Constant and No Trend                      Date: 20/09/20 Time: 08:17                      Sample: 2010M01 2019M12                      Included observations: 119</p> <hr/> <p style="text-align: center;">Conditional Error Correction Regression</p> <hr/> <table border="1"> <thead> <tr> <th>Variable</th> <th>Coefficient</th> <th>Std. 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D(LNGDP(-2))	-0.045390	0.097630	-0.464923	0.6429																																																																																																																																									
D(LNTD)	0.023630	0.028943	0.816427	0.4161																																																																																																																																									
D(LNTD(-1))	-0.076626	0.030286	-2.530073	0.0129																																																																																																																																									
D(LNTD(-2))	-0.000940	0.027984	-0.033573	0.9733																																																																																																																																									
D(LNTF)	-0.020204	0.019709	-1.025116	0.3077																																																																																																																																									
D(LNTF(-1))	0.028275	0.023511	1.202619	0.2318																																																																																																																																									
D(LNTF(-2))	0.009717	0.020096	0.483535	0.6297																																																																																																																																									
Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																									
LNTD	1.754424	0.160304	7.539909	0.0000																																																																																																																																									
LNTF	-1.563738	0.171570	-4.788861	0.0000																																																																																																																																									
C	-0.474859	0.149479	39.27437	0.0000																																																																																																																																									
Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																									
C	-0.020042	0.013009	-1.540623	0.1262																																																																																																																																									
LNPR(-1)*	-0.002629	0.015395	-0.170792	0.8647																																																																																																																																									
LNTD(-1)	-0.070386	0.020869	-3.372719	0.0010																																																																																																																																									
LNTF(-1)	0.074333	0.021983	3.381450	0.0010																																																																																																																																									
D(LNTD)	-0.086600	0.051930	-1.667607	0.0982																																																																																																																																									
D(LNTF)	0.036124	0.035209	1.025993	0.3071																																																																																																																																									
Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																									
LNTD	-26.76932	156.5999	-0.170941	0.8646																																																																																																																																									
LNTF	28.27025	166.4368	0.169856	0.8654																																																																																																																																									
C	-7.622406	45.90586	-0.166044	0.8684																																																																																																																																									
<p>ARDL Long Run Form and Bounds Test                      Dependent Variable: D(LNUR)                      Selected Model: ARDL(3, 3, 3)                      Case 2: Restricted Constant and No Trend                      Date: 20/09/20 Time: 08:23                      Sample: 2010M01 2019M12                      Included observations: 117</p> <hr/> <p style="text-align: center;">Conditional Error Correction Regression</p> <hr/> <table border="1"> <thead> <tr> <th>Variable</th> <th>Coefficient</th> <th>Std. Error</th> <th>t-Statistic</th> <th>Prob.</th> </tr> </thead> </table>	Variable	Coefficient	Std. Error	t-Statistic	Prob.	<p>ARDL Long Run Form and Bounds Test                      Dependent Variable: D(LNGR)                      Selected Model: ARDL(3, 3, 3)                      Case 2: Restricted Constant and No Trend                      Date: 20/09/20 Time: 08:24                      Sample: 2010M01 2019M12                      Included observations: 117</p> <hr/> <p style="text-align: center;">Conditional Error Correction Regression</p> <hr/> <table border="1"> <thead> <tr> <th>Variable</th> <th>Coefficient</th> <th>Std. Error</th> <th>t-Statistic</th> <th>Prob.</th> </tr> </thead> </table>	Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																		
Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																									
Variable	Coefficient	Std. Error	t-Statistic	Prob.																																																																																																																																									

C	0.362018	0.083136	4.354517	0.0000	C	-0.038409	0.012185	-3.152205	0.0021
LNUR(-1)*	-0.124950	0.029115	-4.291616	0.0000	LNGR(-1)*	-0.044565	0.013661	-3.262220	0.0015
LNTD(-1)	-0.010853	0.015544	-0.698243	0.4866	LNTD(-1)	-0.013708	0.005962	-2.299040	0.0235
LNTF(-1)	-0.016031	0.016423	-0.976089	0.3313	LNTF(-1)	0.013314	0.006094	2.184815	0.0311
D(LNUR(-1))	0.480326	0.089525	5.365278	0.0000	D(LNGR(-1))	0.788854	0.093956	8.395960	0.0000
D(LNUR(-2))	0.212724	0.092261	2.305669	0.0231	D(LNGR(-2))	-0.042026	0.094758	-0.443508	0.6583
D(LNTD)	-0.046361	0.037167	-1.247363	0.2150	D(LNTD)	0.007311	0.010456	0.699199	0.4860
D(LNTD(-1))	-0.063958	0.038145	-1.676723	0.0966	D(LNTD(-1))	0.018934	0.010422	1.816758	0.0721
D(LNTD(-2))	0.043412	0.036260	1.197258	0.2339	D(LNTD(-2))	-0.001731	0.009779	-0.177053	0.8598
D(LNTF)	-0.024393	0.027084	-0.900641	0.3698	D(LNTF)	0.005313	0.007379	0.719959	0.4731
D(LNTF(-1))	-0.024828	0.030177	-0.822750	0.4125	D(LNTF(-1))	-0.008211	0.008773	-0.935966	0.3514
D(LNTF(-2))	-0.019230	0.026589	-0.723234	0.4711	D(LNTF(-2))	-0.002998	0.007485	-0.400585	0.6895
* p-value incompatible with t-Bounds distribution.					* p-value incompatible with t-Bounds distribution.				
Levels Equation					Levels Equation				
Case 2: Restricted Constant and No Trend					Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTD	-0.086862	0.122118	-0.711292	0.4785	LNTD	-0.307593	0.093907	-3.275501	0.0014
LNTF	-0.128297	0.129540	-0.990410	0.3243	LNTF	0.298745	0.100210	2.981195	0.0036
C	2.897311	0.097103	29.83744	0.0000	C	-0.861864	0.077792	-11.07903	0.0000
EC = LNUR - (-0.0869*LNTD -0.1283*LNTF + 2.8973 )					EC = LNGR - (-0.3076*LNTD + 0.2987*LNTF -0.8619 )				

**Attachment 5 Error Correction Model Estimation**

	LNGDP (3,3,3)	LNPR (1,1,1)	LNUR (3,3,3)	LNUR (3,3,3)
CointEq(-1)	-2.665390	-0.002629	-0.124950	-0.044565
Prob	0.0000	0.0002	0.0000	0.0003

ARDL Error Correction Regression				
Dependent Variable: D(LNGDP)				
Selected Model: ARDL(3, 3, 3)				
Case 2: Restricted Constant and No Trend				
Date: 06/10/20 Time: 13:31				
Sample: 2010M01 2019M12				
Included observations: 117				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	0.915627	0.181370	5.048390	0.0000
D(LNGDP(-2))	0.326556	0.101230	3.225876	0.0017
D(LNTF)	7.161266	9.356966	0.765341	0.4458
D(LNTF(-1))	10.64442	9.490810	1.121550	0.2646
D(LNTF(-2))	5.951904	8.733188	0.681527	0.4970
D(LNTD)	-3.650392	12.25156	-0.297953	0.7663
D(LNTD(-1))	13.15083	11.90523	1.104626	0.2718
D(LNTD(-2))	-17.75667	11.18937	-1.586923	0.1155
CointEq(-1)*	-2.665390	0.241557	-11.03419	0.0000
R-squared	0.801357	Mean dependent var		0.006239
Adjusted R-squared	0.786643	S.D. dependent var		6.680508
S.E. of regression	3.085766	Akaike info criterion		5.165280
Sum squared resid	1028.371	Schwarz criterion		5.377755
Log likelihood	-293.1689	Hannan-Quinn criter.		5.251542
Durbin-Watson stat	2.121339			
* p-value incompatible with t-Bounds distribution.				
ARDL Error Correction Regression				
Dependent Variable: D(LNPR)				
Selected Model: ARDL(1, 1, 1)				
Case 2: Restricted Constant and No Trend				
Date: 20/09/20 Time: 09:42				
Sample: 2010M01 2019M12				
Included observations: 119				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNTD)	-0.086600	0.041275	-2.098119	0.0381
D(LNTF)	0.036124	0.033604	1.074994	0.2847
CointEq(-1)*	-0.002629	0.000672	-3.911902	0.0002
R-squared	0.100743	Mean dependent var		-0.003553
Adjusted R-squared	0.085238	S.D. dependent var		0.013249
S.E. of regression	0.012672	Akaike info criterion		-5.873998
Sum squared resid	0.018626	Schwarz criterion		-5.803936
Log likelihood	352.5029	Hannan-Quinn criter.		-5.845548
Durbin-Watson stat	0.516116			

* p-value incompatible with t-Bounds distribution.				
ARDL Error Correction Regression				
Dependent Variable: D(LNUR)				
Selected Model: ARDL(3, 3, 3)				
Case 2: Restricted Constant and No Trend				
Date: 20/09/20 Time: 09:43				
Sample: 2010M01 2019M12				
Included observations: 117				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNUR(-1))	0.480326	0.087803	5.470475	0.0000
D(LNUR(-2))	0.212724	0.090420	2.352609	0.0205
D(LNTD)	-0.046361	0.033876	-1.368541	0.1741
D(LNTD(-1))	-0.063958	0.033437	-1.912774	0.0585
D(LNTD(-2))	0.043412	0.032075	1.353461	0.1788
D(LNTF)	-0.024393	0.023808	-1.024572	0.3079
D(LNTF(-1))	-0.024828	0.026179	-0.948412	0.3451
D(LNTF(-2))	-0.019230	0.024421	-0.787420	0.4328
CointEq(-1)*	-0.124950	0.028241	-4.424351	0.0000
R-squared	0.449447	Mean dependent var		-0.003275
Adjusted R-squared	0.408666	S.D. dependent var		0.011174
S.E. of regression	0.008593	Akaike info criterion		-6.602014
Sum squared resid	0.007974	Schwarz criterion		-6.389539
Log likelihood	395.2178	Hannan-Quinn criter.		-6.515751
Durbin-Watson stat	2.058510			
* p-value incompatible with t-Bounds distribution.				
ARDL Error Correction Regression				
Dependent Variable: D(LNGR)				
Selected Model: ARDL(3, 3, 3)				
Case 2: Restricted Constant and No Trend				
Date: 20/09/20 Time: 09:43				
Sample: 2010M01 2019M12				
Included observations: 117				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGR(-1))	0.788854	0.092569	8.521804	0.0000
D(LNGR(-2))	-0.042026	0.090267	-0.465570	0.6425
D(LNTD)	0.007311	0.009301	0.785993	0.4336
D(LNTD(-1))	0.018934	0.009453	2.002836	0.0478
D(LNTD(-2))	-0.001731	0.008916	-0.194201	0.8464
D(LNTF)	0.005313	0.006423	0.827129	0.4100
D(LNTF(-1))	-0.008211	0.007286	-1.127025	0.2623
D(LNTF(-2))	-0.002998	0.006709	-0.446934	0.6558
CointEq(-1)*	-0.044565	0.011978	-3.720750	0.0003
R-squared	0.684603	Mean dependent var		-5.22E-05
Adjusted R-squared	0.661241	S.D. dependent var		0.004042
S.E. of regression	0.002352	Akaike info criterion		-9.193001

Sum squared resid	0.000598	Schwarz criterion	-8.980526
Log likelihood	546.7906	Hannan-Quinn criter.	-9.106739
Durbin-Watson stat	2.009723		
<hr/> <hr/>			
* p-value incompatible with t-Bounds distribution.			

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