

Remittance inflows and economic growth in Indonesia An Autoregressive Distributed Lag Model (ARDL)

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Abstract

This research investigated the long-run influence of remittance inflows on economic growth in Indonesia. Indonesia, one of several world's top receiving countries, also drawn consideration regarding the link between remittance and economic growth in recent years. In 2018, remittances added to 1.8% of Indonesia's GDP, with a share of 0.78 percent in 2011. The general objective of this work is to examine the impact of remittance inflows on economic growth over the period 1983 to 2018. The researcher has settled an Autoregressive Distributed Lag framework or dynamic regression analysis that is widely used to evaluate the relation between remittances and economic growth in the nation. After evaluating the root characteristics of the time series figures, all variables have been identified stationary at the first difference point under the ADF stationary test. The research conducted diagnostic tests such as the residual normality test, Heteroscedasticity, and serial autocorrelation tests for misspecification in order to confirm the estimated parameter outcomes obtained by the estimated model. A stability test for the model is also regulated mostly by the CUSUM test. The ARDL model demonstrates that there is a statistically meaningful long - term positive correlation between remittance inflows and the economic growth of Indonesia's gross domestic product.

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Although the money supply is significant in 5%, however, it is negatively correlated with economic growth.

Keywords: *ARDL, Inflow Remittance, Economic Growth, Error Correction Model.*

1. INTRODUCTION

In the last two decades, economic analysis of remittances has pinched substantial attention in research and policy fields, stretching from the microeconomic perspective of remittance behavior (Funkhouser, 1995) to the macroeconomic lookout that designates the economic influences of remittance (Glytsos, 2002). Remittances are income and transfer of goods with the support of immigrants to their friends and families. The accepted thinking in Indonesia is that the beneficiaries spent this income on one essential consumer good (food) at the margin and on one required investment good more at the margin education (Rahman, Md Mizanur; Fee, 2009). Remittances have been mentioned as an instrument in Indonesia to combat poverty (Hartarto, Romi ; Azizurrohman, 2018). The growth in remittance income helps to develop the economic situation of the migrant family, and If they receive a high wage, they will send money (a remittance) to their Indonesian family through controlled institutions, such as banks (Nahar, Faiza Husnayeni ; Arshad, 2017). Preceding studies on remittance effectiveness characteristically originate varied results, and academics were skeptical about remittances ' developmental outcomes (Chami et al.,2005). To address, in some countries positive correlation is accepted, for example in Pakistan (Dilshad, 2013), Sub-Saharan African Countries (Atanda & Charles, 2014), Bangladesh (Chandra Majumder, Shapan; Donghui, 2016), West Africa (Barnes Evans et al., 2015) and in India (Jayaraman et al., 2012). While in Mediterranean countries (Glytsos, 2002), Ethiopia (Tolcha, Tassew Dufera ; Nandeeswar Rao, 2016), and Nigeria (O Oshota, Sybil; A Badejo, 2015) negative impact is accepted.

The countrywide growth analysis confirms that remittances have significant positive effects on long - term economic growth since migration will enable migrants to acquire new skills and promote cross - border trade and investment connectivity (Ali, Mansoor; Bryce, 2006). Chami et al. (2005), remittances are unlikely to act as free movement of capital. Nevertheless, remittances are meant only to reimburse their beneficiaries for adverse economic effects, and that it should have a negative relationship to growth in income. While from another angle, capital flows like foreign direct investment are profit-driven and have a positive correlation with growth in GDP.

They also indicated that remittances appear to correlate negatively with GDP growth, as they are only compensatory. Although remittance inflows effectiveness characteristically originate varied results. However, in developing nations, the positive impact of remittance has increased significantly. Additionally, a research by Claudia M Buch, Anja, Kuckulenz, and Marie-Helene (2002), gross remittances to poor economies was estimated at USD 81 billion each year in the 1990s.

In Indonesia, remittance inflows were considered as a vigorous source of foreign income with such a vivid increase as of 10\$ million in 1983 to 11679\$ million in 2019, this generous increase in income and inflow of goods contributes 1.1 percentage of the total gross domestic product (World Bank, 2019).). Indonesia is among the countries that rely significantly on remittances whose origin country is typically Malaysia. Nahar et al., 2018, also indicates that remittance inflows have a substantial influence on Indonesia's economic growth, including the other variables. Other variables used in his study were foreign aid, short - term debt, and trade openness, and the results of the research found as almost all variables would have positive consequences on economic growth, excluding the trade openness, which was found as adversely correlated with economic growth.

There are high numbers of Indonesian refugee workers in Malaysia, at the same time. With the stress that Indonesia's unemployment rate is the push factor towards emigration. The remittance is, at the same time, the pull factor for the Indonesian migration to Malaysia. As a result, when the unemployment rate in Indonesia is high, the population is likely to seek job opportunities in Malaysia or other countries. On the other hand, as Indonesia receives more remittances, its people are motivated to work or stay abroad (Rahim, Dayangku Aslinah; Mahmud, 2017). The impacts of migration and remittances will undoubtedly fluctuate subject on the migrants ' femininity. Immigration and remittances diminish the residual members ' amount of labor in sending households. Female migrants may choose modified custom of their remittances somewhat than increased adult leisure, or take children out of the workforce (Trang & Ririn, 2011). Abrego, 2009; and Guzmán et al., 2006 discovered that perhaps the gender of the remitter is indeed a substantial determinant of household expenditure pattern only after we control the capacity of the remitter to manage how household remittances allocate their resources. When these factors are taken into account, households that receive remittances from female remittances (as opposed to male

remittances) earmark a more significant portion of spending on health and other goods, but a lower share on food.

Remittances also were believed to have an impact on the growth of a child's intellectual resources, including whether the migrant child works while taking classes, whether the child misses marks, or whether the child experiences educational disturbance. As a result, the trade-in parents who leave home and work abroad continue to damage the accumulation of human capital by the child, And this can be understood in the long term as having an impact on economic growth (Rasyad A, Parinduri; Shandre, 2011). However, Bansak & Chezum (2009) Highlighted that the net positive remittances improve children's likelihood of education. Also, a Research by Rasyad A, Parinduri; Shandre (2011), Lists that even in Indonesia remittances improve children's school attendance, in contrast, research also indicates that child education quality does not increase as a result of remittance and parent selling and job in the rest of the country seems to be affecting child human capital negatively. Over time there has been an increasing number of international migrants. At the same time, women's participation in international migration has also increased. So in light of the World Bank data we can conclude that the female share in migrants is increasing As in 2005, women migrants were almost half of the world's migrant inventory (World bank, 2008). As a result with an upward worldwide trend in migration, Indonesia has become one of the nation's biggest export - oriented migrant labor countries. International migration from Indonesia was primarily dominated by women. According to World Bank data, approximately 80% of Indonesia's migrant workers in 2007 were female migrant workers who had been registered. Its main reason why most Indonesian workers move outside their homelands is because of their economic challenges. Because of low pay or unemployment, most workers can not sufficiently meet their basic needs. In Indonesia, unemployment and underemployment rates will lead to a lack of employment opportunities, particularly for unskilled workers. The unemployment figure in 2016 was 6.2%(IOM, 2010).

Increasing immigration of Indonesian workers to several other countries results in remittances, which would also enhance the economic wellbeing of migrant households in the home country. Remittances have indeed been identified as the second-largest source of external financing in developing nations (Asian Development Bank, 1992). In 2010, developing countries received 325\$ billion from global remittances, which amounted to about 440\$ billion. Also, Indonesia received 2.18 percent of total remittances from developing countries, which is equivalent to 7.1\$ billion

(Asian Development Bank, 1992). Given all of these published papers, this research is working to enhance contemporary writings by scrutinizing the influence of remittance inflows on Indonesia's economic growth during the period 1983 to 2018. The ARDL model would be used for estimating time - series.

2. LITERATURE REVIEW

Remittances are known as personal income transitions through one or more family and friends living abroad to that same lasting family part within the host country (Gapen et al., 2007). Remittances inflows alleviate poverty by allowing recipient families to enhance their consumption (Buch & Kuckulenz, 2010; Ratha & Mohapatra, 2007). Chaaban and Mansour (2012) indicated that sending remittances would affect education considerably and that the broader implications of both outcomes for men and women in Jordan and Syria are much more significant but less so in Lebanon. It indicates that the factors of gender are still relevant for household investment choices in the human capital of the sibling in some countries around the world.

A large number of studies on remittance inflows and economic growth have been carried out worldwide. Meyer and Shera (2017), in their study, 21 non - industrialized States have analyzed the role of remittance inflows on macroeconomic aspects. The research showed the positive effect of remittance inflows on economic growth, with 1% higher remittance inflows, which resulted in a GDP increase per head of 0.14% for the Albanian region. Also, Giuliano, Paola, Ruiz-arranz (2006) Remittances have often been identified as an effective way to address financial hardships in financial investment. Investment, however, is not the only way to promote development. Other indicators, such as spending on education, usage, and employment, have been finding that remittance inflows are growing economic growth for 100 developing countries, especially in countries with a less functioning financial system. It is indeed exciting and overwhelming, while most policymakers have focused mostly on reducing the costs of remittance inflows than on resolving economic growth through remittances. There seems to be a tendency to increase growth very well in countries that have a sound financial system composed of credit markets.

Furthermore, research from Akter (2016) In Bangladesh, remittance was found to be a critical factor in the private capital movement to boost economic growth in Bangladesh. Different effects were reported from remittances to macroeconomic indicators that would indirectly reduce poverty, increase investment, and generate savings. While in Morocco, Tabit, and Safaa, Moussir (2017),

It has been noted that remittances represent an economic growth commitment, with a 35% elasticity in the short term. While remittances are said to be stable and low volatility, it is far less than a long - term period of about 88 percent. A focus on use rather than investment purposes can be attributed to perceived justification.

Moreover, in the case of Nepal, Sharma (2017) Socio-economic problems of remittances investigated. The nation of Nepal rests as the poorest country in the world but is one of the top countries to receive remittance. The Federal Democratic Republic of Nepal is still one of the world's poorest countries. In this scenario, because of the more significant impact of consumption and GDP growth, the role of remittances in economic growth is significant. Remittances, however, lead to moral hazard, Netherlands diseases, and economic deficits from the selling of luxury goods imported and so forth.

During the period 1995 to 2006 for Saharan Africa, The extent of remittance contribution to economic growth relied mostly on families of migrants. If the families of employees had used remittances towards consumption rather than investment purposes, they might drastically cut on the exposure to remittances as just a source of investment but not stimulate economic growth. Even so, the analysis concluded that new remittances would have been a matter of contrast to reflect on how the recipient of the remittances used it. Remittances via financial services, like savings, can spur economic growth enormously. Consequently, cutting the cost of remittances could markedly allow the government to retrieve many more remittances as the banks are not interested in controlling the market for small remittances (Gupta, Sanjeev; Pattillo, Catherine A.; Wagh, 2009). On the other hand, in light of the research by Ratha and Mohapatra (2007) suggests that remittances increase consumption and not promote growth, poverty, and inequality are likely to decrease as a result of increased per capita income from remittances. Also, this research suggested that skilled workers could minimize growth in the home country. Nahar, Faiza Husnayeni , and Arshad (2017) has been reported that highly skilled workers bring their families to the country of destination. The worker did not remit money because he no longer paid attention to people in the countries of origin. While highly skilled workers could decrease growth by investing in remittances of physical and human capital, they would enhance financial development and contribute to growth in the future. Besides, According to Ahmed (2010), Remittance flows into Bangladesh have indeed been statistically meaningful but are detrimental to growth. However, from a different point of view, there seems to be a positive link between productive investments and export and growth, although

foreign direct investment does not affect. Besides, KARAGÖZ (1891) has also shown that the flow of remittances to Turkey has a statistically significant but negative impact on growth.

According to Das Anupam & Chowdhury (2011) Endorsed a positive long - term relationship among both remittances and GDP in Bangladesh, the Dominican Republic, El Salvador, Gambia, Guatemala, Honduras, Jamaica, Lesotho, the Philippines, Senegal, and Sri Lanka. The magnitude of the remittance-GDP ratio is, however, quite low in all these countries. Datta, Kanchan, and Sarkar (2014), during the last 20 years, remittances in Bangladesh has increased markedly to even more of about 10 % of GDP since 2008. Even though remittances could indeed reinforce growth and development and also avoid balancing the problems of payments, their effect on economic growth could also be harmful if they are used for unproductive consumption. Remittances can ultimately depend on easy money to decrease their ability to contribute and its involvement in the employment market, which would negatively influence economic growth. Shahzad et al. (2014), demonstrates the positive effect of long-term debt, remittance inflows, exports, and investment in such a direct pattern by foreigners on economic growth in South Asia.

In contrast, it is also suggested by the author that the factor of labor negatively influences the economic growth in South Asia nations. The author furtherly suggested that causality tests evidence the incidence of long-term balance interactions among economic growth, labor, capital, remittances, exports as well as Foreign Direct Investment. Throughout the short-term, the exports of Granger are the origin of growth and FDI or Direct Investment Granger is the basis of exports. So for the casualty is verified among the mentioned variables in South Asia.

Moreover, Tasneem (2004) points out that remittances are a crucial tool for supporting economic growth in Bangladesh. The researcher also found that it is the country's largest foreign - exchange earnings market and that macroeconomic growth in different sectors, from agriculture to utilities, has a direct relationship with migrant remittances. The result of the paper also declares that remittance inflows is a vigorous basis of the country's development funds, and the amount received by way of remittances seems higher compared to the amount of foreign aid to Bangladesh. Besides, a research conducted by Chandra (2016), also mentioned that money transfers like remittance inflows are having a significant positive long - term influence on Bangladesh economy, while at the same time, the researcher considered the impact of remittances on economic growth (GDP) and followed the Autoregressive Distributed Lag (ARDL) model with three independent variables, money supply, remittance inflows, and inflation. The author of the paper agreed with the long-

term association among variables and that they shift together. Marwan et al. (2013) also showed that there is indeed a long - term positive relationship in Sudan amongst growth, exports, and remittances. Remittances are anonymous money transfers around territories, often involving different currencies.

Nevertheless, burgeoning studies on the topic still ignore the context that exchange rate regimes and money supply function in estimating the impact of foreign - currency remittances on the receiving countries. Christopher P et al. (2012), Findings revealed that remittance inflows would briefly lead to higher prices, GDP, domestic money supply, and raise real exchange rates inside a fixed regime. In contrast, reducing inflation temporarily, the author applied the theoretical framework, including panel-vector auto-regulation techniques that demonstrate the effect of GDP remittance, inflation, real exchange rate, and money supply in Open Economies. Besides, research by O, Kenneth et al. (2015), illustrates as here is a real long - term link between indicators, remittance inflows, exchange rates as well as the supply of money in Nigeria. There have been few reports on remittance inflows in Indonesia in the light of the literature as a whole. However, these studies have narrowed their trends and consequences, including particular household consumption and investment, the gender aspect, the growth of children's human capital, and risk alleviation. This article thus creates a critical involvement in the prevailing literature by examining the correlation and causality among remittance inflows and economic growth in Indonesia.

3. METHODS AND ECONOMETRIC FRAMEWORK

3.1. Methodology

This part presents the methodological approach used for this research by giving a method used to analyses the effects of remittance inflows on economic growth in Indonesia, taking the period from 1983 to 2018. This phase also includes the clarification of the information sources, research methods, and diagnostic tests used for this study. This research analyzes the causality relationship between remittance inflows and long - term GDP growth. The paper was carried out based on secondary sources. Almost all of the information is chosen to take from World Bank Indicators (WBI-2018) and publications from reputable journals and some other sources. The study uses annual time series data from Indonesia during the period 1983 –2018. These information sources are widely accepted, as well as the data supplied has been commonly used in the world. Therefore, the data and information of the sources included in this study are accurate. The root test of the

Augmented Dickey-Fuller (ADF) unit is used to verify whether the variables are stationary. Also, for evidential analysis of long - term relationships and dynamic interactions among variables of interest, the model was estimated using the bounds testing or the ARDL cointegration technique introduced by Pesaran et al. (2001). The technique shall be adopted for the following three aspects. First, the bound testing process is simple. Unlike other multivariate techniques of cointegration, such as Johansen and Juselius (1990), it enables the cointegration relation to be determined by OLS once the lag order of the model has been established. Second, the bound experiment process does not require a pre-testing of the variables used in the unit root method, unlike some other methods including the Johansen approach. It is true whether variables in the method are strictly (0), purely I (1) or co - integrated. Third, the ARDL model is much more stable and looks nicer for a small sample size than traditional co - integration approaches (Pesaran, Hashem; Shin, 1995). Therefore to assess the influence of remittance inflows on GDP growth, the investigator outlined the essential econometric technique. The independent variables are remittance inflows and Money supply, while the dependent variable is the economic growth of GDP. Taking into consideration the studies of Chandra & Shapan (2016), (Shah & Saba (2012) and Siyasanga & Halefang (2017), we can write the model as follows:

$$GDP = f(RI, M2) \dots\dots\dots I$$

Where, GDP = Gross Domestic Product, RI = Remittance inflows (Million \$US), M2 = Money supply (% of GDP).

If we take ln of the equation (1) we derive a new equation that is equation (2) and as follows:

$$LnGDP = \beta_0 + \beta_1 lnRR_t + \beta_2 EXPORT_t + \mu_t \dots\dots\dots II$$

Where: $\beta_0 = Intercept$, $\beta_i = i = 123 \dots \dots n$ are coefficients and $\mu_t = Error term$

A vital hint in determining relations is the concept of causality. Also, for checking the cointegration between the variables, the ARDL method is used. Approaches to cointegration and error correction through the ARDL method are not unique to comprehensive research experiments using the root unit study. Nonetheless, a new approach to this study is to assembly the factors, including Remittances inflows and Money supply, and to test their impact on GDP.

3.2. Empirical results and analysis

3.2.1. Unit Root Test

The ADF test, offered by Dickey & Fuller (1979), is executed in this article to study the stationary features of time series. The test involves calculating regression:

$$\Delta Z_t = \alpha + \gamma t + \beta Z_{t-1} + \sum_{i=1}^{k-1} \theta_i \Delta Z_{t-1} + \mu_t \dots\dots\dots \text{III}$$

In equation (3), α represents the constant, and γ is the coefficient of the time series. The variable Z is the crucial variable in the equation. Therefore, the Z variables include in our case as $\ln(\text{RI})$, $\ln(\text{M2})$, and $\ln(\text{GDP})$. Δ It is the generator of first divergence (difference); t is a trend of the time, and μ is random error stationarity. The coefficient given in equation (3) indicates that the test for a unit root is carried out for the Z_{t-1} . Whether that coefficient deviates significantly from the spatial bias, which is negative (i.e., $\beta < 0$), the alternative hypothesis is preserved. We thereby reject the null in which the variable Z has a root unit problem, meaning that the variable Z does not have a root unit. The appropriate lag size also was computed via the AIC in the Augmented Dickey-Fuller test. The result of the amplified Dickey-Fuller (ADF) test for the stationarity of the three original series can be seen in Table 1. The statistic represents that the ADF t - values for all variables are more significant than the critical values; thus, the series is not stationary. The study shows that all variables are not stationary at the level. In other words, they are not integrated in the order $I(0)$ zero, so they became stationary after the first difference $I(1)$.

Table .1 Results of the ADF unit root test

Variables	ADF Test			Results
	t-test	Prob.Value ¹	Critical Value at 5%	
lnGDP(**)	-5.783813	0.0002	-3.548490	✓ I(1)
lnRemR(**)	-8.254373	0.0000	-3.548490	✓ I(1)
lnM2(**)	-3.843915	0.0261	-3.548490	✓ I(1)

(**) intercept and trend 1. Denotes a significant level based on the McKinnon critical vale first

3.3. Co-Integration

The primary focus of this paper is to address the long-run effect of both Remittances Inflow and Money supply on economic growth. Checking for the cointegration of the variables is thus an

empirical function. This study uses the ARDL or bound test method suggested by (Pesaran, Hashem; Shin, (1995), to test for the relationships that co-integrates.

The process of checking the bounds includes three phases. The first move is to create a relationship that will last long. The first step is to calculate the model for error correction using GDP (Y) as a dependent variable, and the subsequent ECM models are constructed:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^n \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^n \beta_2 \Delta RI_{t-i} + \sum_{i=1}^n \beta_3 \Delta M2_{t-i} + \gamma_1 GDP_{t-1} + \gamma_2 RI_{t-1} + \gamma_3 M2_{t-1} + \mu_t \dots \dots \dots \text{IV}$$

Once the ARDL equation is accessible, we take the second phase of measuring the F-test value to verify the long-term relationship presence. The Null hypothesis for no cointegration amongst the variables in equation four is:

$$\text{Null Hypothesis or } H_0 = \gamma_1 = 0, \gamma_2 = 0, \gamma_3 = 0$$

It is to say as there is not long-term cointegration. The H_1 hypothesis, however, is:

$$H_1 = \gamma_1 \neq 0, \gamma_2 \neq 0, \gamma_3 \neq 0$$

Throughout the last stage, the F - test must be measured while at the same time keeping the upper and lower 90, 95, or 99 percent critical value ranges under consideration. The study of Narayan (2004) Explains the following sets of binding critical values shown in Table 2. One set pretending that all regressors are I (1) and another set is suggesting that they are all I (0). There were also three conditions under which the test must come to a decision. Firstly when the F - test is higher than the upper bound value (i.e., I (1)), it merely implies long - term cointegration. Similarly, when the same F - test is less than the lower limit value (i.e., I (0)), then there is no long - term cointegration of the data; it is indeed wise to develop only the short-run ARDL. Hitherto, if the F-test value lies in the middle of these two bounds, then it is simply concluded that the data is inconsistent. The outcomes of the cointegration experiments for ADRL bounds are accessible in table.2. It demonstrates the F statistics that eventually result when the economic growth regression is normalized. The cointegration relationship preference was restricted to the variable of growth as a dependent variable only due to the strict application of the growth regression model. The statistics measured F — (3.947764) is higher by 1% than the central limit, 5 % and 10% as indicated in Table 2, which showed that the model integration null-hypothesis was rejected by 1%— 5 % and 10% Hereafter, the long-run link between variables can be inferred from the ARDL boundary check. The best lag-length for AIC is 1. And the respect outcome is shown in Table 3

Table 2. F-tests for cointegration

F-Statistics	90%		95%		99%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
3.947764	2.845	3.623	3.478	4.335	4.948	6.028

Table 3. Optimal lag-length selection

Lag	LogL	AIC	SC	HQ
0	-57.76557	3.682762	3.818808	3.728537
1	68.75072	-3.439438*	-2.895253*	-3.256336*
2	75.13038	-3.280629	-2.328306	-2.960202

SC: Schwarz information criterion
 AIC: Akaike information criterion
 HQ: Hannan-Quinn information criterion

Table 4 offerings the results of the expected long-term correlations. The findings indicate that the remittance inflows in Indonesia and their GDP are directly related; the remittance inflows coefficient is statistically significant and optimistic. The findings further reveal that there is a 0.5503 percent increase in GDP for a one-unit growth in remittance inflow having a probability LOS lesser than critical 0.05 alpha value. In contrast, Indonesia’s money supply has a significant effect but negatively correlated to GDP, while the partnership is favorable. These findings, therefore, follow both hypotheses and scientific research, and remittance inflows primarily promote Indonesian economic growth. Concerning the signs and magnitude of the coefficients, which represent the stimulus of remittance inflows on economic growth, the model showed that remittance inflows (RI) showed their anticipated sign while money supply (M2) does not.

Table 4. Long-run estimated results

Variables	Coefficients	St. Error	t-statistics	Prob
LN RI	0.550366	0.063976	8.602733	0.0000
LN MS	-1.057060	0.470538	-2.246491	0.0319
C	18.87610	1.769689	10.66633	0.0000

$$EC = \ln GDP - (0.55036 \cdot \ln RI + 1.057060 \cdot \ln M2 + 18.87610)$$

3.4. Error Correction Model:

To find out the Error Correction Model, We have the following equation as follows:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^n \beta_1 \Delta GDP_{t-i} + \sum_{i=1}^n \beta_2 \Delta RI_{t-i} + \sum_{i=1}^n \beta_3 \Delta M2_{t-i} + \gamma_1 GDP_{t-1} + \gamma_2 RI_{t-1} + \gamma_3 M2_{t-1} + \varphi ECT_{t-1} + \mu_t \dots\dots\dots V$$

The ECM findings are shown in Table 5. Results show that following regulation of other factors, the change to Remittance inflows immediately affects GDP. The results also show that the expected negative sign of ECM is not statistically significant. The sign of the error correction term indicates that the model is fit, but not statistically significant for the long-run cointegration.

Table 5. Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011456	0.052420	-0.218541	0.8285
D(GDP(-1))	0.775921	0.395248	1.963125	0.0593
D(RR(-1))	0.184539	0.094772	1.947194	0.0613
D(MS(-1))	-0.508236	0.456734	-1.112760	0.2750
ECT(-1)	-1.072357	0.439140	-2.441950	0.0209

3.5. Diagnostic and Stability Tests

Tables 5 contain three diagnostic tests, and all other diagnostic tests other than the Normality test confirm the reliability and significance of the pattern. The series association LM test shows that the chi-square results of 0.3091 with a confidence value of 0.5812 demonstrates we do not deny the null hypothesis. Similarly, the tests of the heteroscedasticity check reveal that in the data structures, there is no autoregressive conditional heteroscedasticity with such the likelihood value of 0,5279 and a probability value of 0,6655, respectively. The J-B check statistical rating of 34.9253 shows the evidence is anomalous, and the null hypothesis is denied. Meanwhile, for the data stability, the Ramsey RESET test is applied to check if there is any model stability in the data. The result confirms that the data is structurally normal and has no sign of lag breaking.

Table 6. Results of Diagnostic and Stability Tests

Test	H ₀	Statistics	P-Value	Decision
SC*	There is no serial correlation in the residual	0.602244	0.5548	Retain the H ₀
HE**	There is no autoregressive conditional heteroscedasticity	1.017331	0.4148	Retain the H ₀
NO***	Normal distribution	188.5475	0.000000	Reject the H ₀

RR****	Absence of model misspecification	0.698809	0.4103	Retain the H_0
*Serial Correlation **Heteroscedasticity ***Normal distribution ****Ramsey RESET				

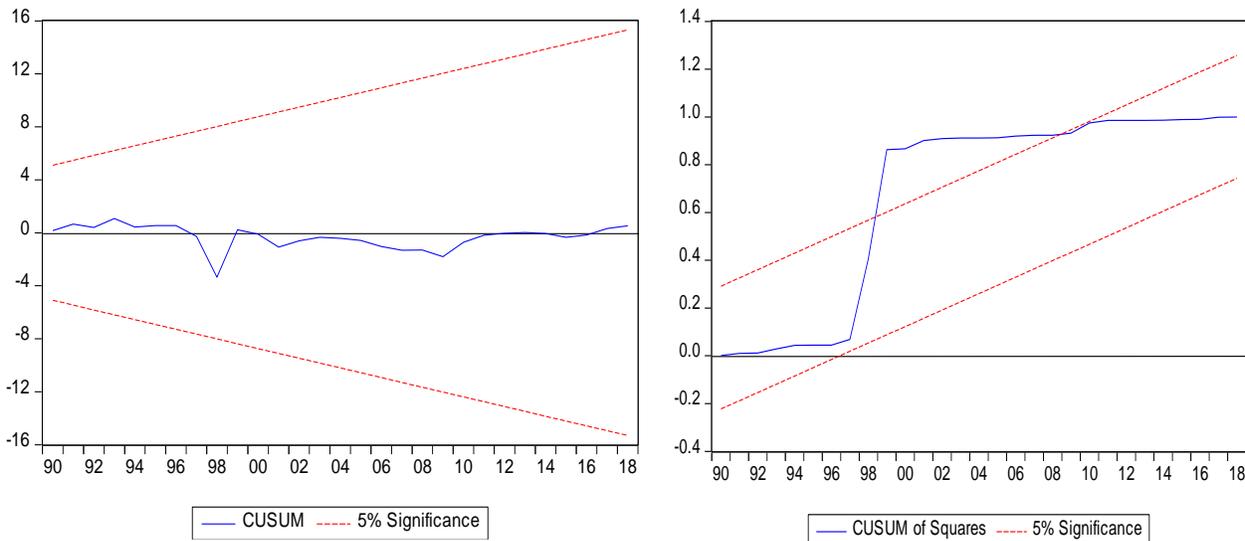


Figure 1 Plots of CUSUM and CUSUMSQ Plots at 5% L.O.S.

Figures 1, respectively, display the CUSUM and CUSUMSQ plots for long-term stability tests and short-term transfers of the ARDL Error Corrections pattern. If plot estimates of the (CUSUM) and CUSUMSQ stay within critical 5 percent of the point of significance of the crucial limits, the null hypothesis is compatible and not dismissed for all coefficients of regression. The null hypothesis can, therefore, be retained. For more study, the readers can refer to Hisashi (1995) study on CUSUM and CUSUMSQ. A review of Figures 1 reveals that estimates from CUSUM are so far below the level of confidence of 5%, which indicates a robust coefficient for the long-run and short-run throughout the ARDL error correction model. However, in the case of CUSUMSQ, it lies above the 5% level of significance during the year 1999, which is structurally facing instability in that particular period.

4. CONCLUSION

The paper declared the impact of remittance inflows and money supply on the economic growth of Indonesia, using time series data from 1983-2018 by engaging the Bounds testing scheme. Findings showed that after the first difference, the time series for the models gotten stationarity.

These findings were obtained by using root unit tests from ADF. The ARDL cointegration test also reveals that Indonesia's output growth has a strong positive correlation with the remittance inflows. Nonetheless, a negative link is found among the variables' currency supply and economic growth, which corresponds to the findings of some of the previously published findings. On the other hand, remittance inflows can be taken as a supporting tool for economic growth in Indonesia. Consequently, efforts are required to endorse these channels and improve formal channels for the transformation of remittances. It is also necessary to manage and raise further influxes, including remittances of contemporary money.

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