

RESEARCH ARTICLE

# The Effect of Remittances on Indonesia's Economic Growth and Exchange Rate

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This study aims to measure the effect of remittances by Indonesian workers from abroad on Indonesia's economic growth and exchange rate. This study uses the vector autoregression (VAR) model to see the interrelationship between the variable and the error-correction model (ECM) in the short term and the long term. The results show no causal relationship between remittances and economic growth in Indonesia. Remittances have also proven to have no effect on Indonesia's economic growth, both in the short and long term. The Granger causality test on remittances has been proven to affect the exchange rate significantly. However, there is no short-term or long-term relationship between remittances and exchange rates. This is because the remittances received by Indonesia can still be classified as small. Hence, they are not able to sustain Indonesia's economic growth and exchange rate.

**Keywords:** Economic growth, Exchange Rate, Migration workers, Remittances

**JEL Classifications:** F24, F31, F43

One of the economic problems of a country is employment (Soleh, 2017). Countries with a high rate of population growth on an ongoing basis will also impact the high demand for labor. When the country's economic condition is declining, it does not allow its economic activity to absorb excess labor or the state; hence, the unemployment problem becomes more serious (Primawati, 2017). With the increase in unemployment, another economic problem will arise: the high poverty level.

To solve this labor problem, the government has established a cooperation policy with other countries, which is sending workers abroad. The labor migration that occurs is evidence that there are socioeconomic disparities between one country and other countries, such as differences in economic growth and inequality in development facilities. These workers will move from countries with low economic levels to countries with higher economic levels where the opportunity to find work is greater, and the wages offered will also

be better. As a form of export activity in the service sector, sending labor abroad will also contribute to foreign exchange inflows into the country. Hence, international labor migration will affect a country's economic growth.

Indonesian workers abroad contribute to remittances as a source of foreign exchange income for government institutions and also a source of income injection for households. Remittances are part of the transfer of funds by migrant workers to recipients in their countries of origin (Bank Indonesia, 2012). The flow of remittances that enter Indonesia becomes a source of income for the families of migrant workers in the area of origin. Hence, they can continuously increase household consumption. Furthermore, it will also affect income distribution and increase the quantity and quality of output in the industrial sector. In addition, remittances also have the potential to be allocated to investment so that the final impact will affect the more advanced condition of the Indonesian economy. The productive use of remittances can help a country sustain and promote economic growth by investing this money in consumption and investment (Meyer & Shera, 2017).

It is necessary to research on the relationship between remittances, economic growth, and exchange rates to explain how this condition can occur. In addition to remittances, the other control variables, such as consumption and investment, will also be used to see which variables are more influential in responding to the growth variable. Reserves and foreign aid variables will also be used as control variables to compare the relationship between remittances and the Indonesian exchange rate. In addition to remittances, the reserves variable also has the potential to affect the exchange rate because it reflects the resources available to the central bank to intervene in the foreign exchange market. Likewise, foreign aid variables can also potentially affect the exchange rate, as the study of Dorantes (2004) showed, where the real exchange rate appreciates against shocks in foreign aid. Foreign aid spending is more directed at the non-trade goods sector so that the real exchange rate appreciates.

Research on the relationship between remittances and economic growth and exchange rates has been conducted by many researchers. However, no study has been conducted in Indonesia that discusses both at once in a period of 30 years, which is the period 1990–2019. This period is interesting to study because

there are several world economic phenomena that had an impact on the Indonesian economy, ranging from the monetary crisis (1997), the global financial crisis (2008), to the US-China trade war (2019).

Several previous studies have different research results. This depends on which country is used in the study and what variables are included. This study is also conducted to examine the causal relationship and measure the short-term and long-term effects of remittances made by Indonesian migrant workers on economic growth and the Indonesian exchange rate.

## **Theory Basis and Hypotheses Development**

### ***Labor Migration***

Labor migration is the movement of people across borders with the aim of working in a foreign country (International Organization for Migration, 2009). Migrating workers can have a positive impact, especially on their country of origin, through remittances from the income they earn while working abroad. It can help the development of their home country by becoming a source of foreign exchange flows, reducing unemployment and poverty.

### ***Remittances***

Remittances are transfers of funds by foreign workers to recipients in their home countries (World Bank's World Development Indicator, 2016). Remittances sent by migrant workers are an important instrument of international capital flows, especially for labor-sending countries. Currently, the definition of remittance has expanded. This is not only in the facet of money and goods but also skills and ideas, which can also be classified as remittances for the country of origin. Remittances play a huge role in the economies of many countries. Remittances cannot be separated in a migration process. A remittance is a form of output from the international labor migration process.

### ***Economic Growth***

A country can be considered to experience economic growth when there is an increase in per capita income (O'Sullivan, 2006). Economic growth is one of the macroeconomic goals of every country. However, it is also a problem that must be faced in the long term. This is because, at this time, economic growth has been used as a benchmark for the progress and welfare of a country. Economic growth is usually

measured using the level of Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP) in a region. A country is said to experience an increase in economic growth if the output growth rate is at a faster rate than the population growth rate.

### *Exchange Rate*

Exchange rate can be defined as the value or price of one country's currency unit as measured by another country's currency unit. The exchange rate can experience two changes. These changes are called appreciation and depreciation. Appreciation is defined as an increase in the price of a country's currency against foreign currencies. Meanwhile, depreciation is a decrease. The appreciation is due to the high supply and demand in the foreign exchange market. On the other hand, depreciation occurs when there is less demand and supply for the currency.

### *The Relationship of Remittances and Economic Growth*

The relationship of remittances to economic growth is shown from research results that they have a positive influence on economic growth in various countries. Meyer and Shera (2017) explored the impact of worker remittances on economic growth in Albania and five regional countries. They found that workers' remittances contributed positively and significantly to economic growth in six countries. Workers' remittances contribute positively and significantly to economic growth in six countries. Its productive use will help the economies of these countries sustain and promote economic growth by allocating remittances to consumption and investment. Ziesemer (2012) also found that remittances have a direct positive impact not only on the growth rate of GDP per capita but also on the level of savings and public spending on education (investment).

H1: Remittances have a causal relationship and a significant positive effect on Indonesia's economic growth in the short and long term.

### *The Relationship of Remittances and Exchange Rate*

Several studies show various kinds of effects of

remittances on the exchange rate. Some of them show the effect of appreciation to overshooting the exchange rate. Afterward, some countries even experienced the phenomenon of Dutch Disease, which is certainly detrimental to the country receiving the remittance. Others point out that remittances by foreign workers have a depreciating effect on the country's exchange rate. The appreciation of the real exchange rate, with the associated loss in external competitiveness, incurs economic costs on the export sector of the recipient country by reducing its international competitiveness (Dorantez, 2004). The effect of real exchange rate appreciation stemming from remittance inflows can be made weaker by trade liberalization. Meanwhile, trade openness causes real exchange rate depreciation.

H2: Remittances have a causal relationship and a significant positive effect on the exchange rate in the short and long term.

## **Research Methods**

### *Data and Sample*

This research uses a quantitative approach that focuses on testing a theory, showing the relationship between variables, developing a concept, presenting a fact, or describing statistics from data in the form of numbers and developing understanding. This study uses secondary data in the form of a time series in Indonesia from 1990 to 2019. The analytical technique used in this study is a quantitative analysis technique. The data processing in this study uses Microsoft Office Excel 2013 and StataMP 14 software. The data processing method used in this study is the vector autoregression (VAR) method, which will then be combined with an error correction model into a vector error correction model (VECM).

### *Variables and Variable Operational Definitions*

This study consists of independent variables (economic growth), dependent variables (remittances), and control variables (consumption, investment, foreign exchange reserves, and foreign aid). Table 1 lists the operational definition as the basis for the variables used.

**Table 1** *Variables Definition*

Variables	Definition
Remittances	REM Transfers of funds made by foreign workers to recipients in their home countries, of small value, and are conducted between individuals. Remittances are measured using personal remittance data as well as received (% of GDP) using personal remittance data and (USD).
EconomicGrowth	GROWTH The country’s GDP level. It shows how far the country’s economy has grown or shrunk. The growth variable in this study is measured using GDP growth data (%).
Consumption	CON Expenditure on goods and services by households for individual consumption and collective (government) consumption. It is calculated as final consumption expenditure. The consumption used in this study is the final consumption expenditure (% of GDP).
Investment	INV The ratio of gross fixed capital formation to GDP. The investment variable used in this study is gross fixed capital formation data (% of GDP).
Exchange Rate	ER The price value of a currency of one country measured in the currency of another country. This study uses exchange rate data (USD) sourced from the World Bank for the period 1990–2019.
Foreign Exchange Reserves	RES All foreign assets or assets held by the central bank for monetary policy and can be used to finance the balance of payments imbalances by intervening in the foreign exchange market. The data used in this study is the total foreign exchange reserves, including gold (USD).
Foreign Aid	AID The transfer of money, services, or international goods from the government or international institutions to the recipient country for a particular interest. The delivery of such aid is considered a significant source of foreign exchange.

**Model**

$$GROWTH_t = \beta_0 + \beta_1 REM_{t-1} + \beta_2 CON_{t-2} + \beta_3 INV_{t-3} + \epsilon_t \tag{1}$$

$$ER_t = \beta_0 + \beta_1 REM_{t-1} + \beta_2 RES_{t-2} + \beta_3 AID_{t-3} + \epsilon_t \tag{2}$$

Where:

- GROWTH = GDP growth (%)
- REM = Personal remittance, received (% of GDP)
- CON = Final consumption expenditure (% of GDP)
- INV = Investment as gross fixed capital formation (% of GDP)
- B0 & ε = Intercept term and error term in the model
- ER = Exchange Rate (USD)
- REM = Personal remittance, received (USD)

- RES = Total Reserves (USD)
- AID = Foreign Aid (USD)

**Results And Discussion**

**Descriptive**

Table 2 shows a statistical description of Equation 1. It shows that the variable economic growth (GROWTH) has a standard deviation value of 3.687602 (below the average). It means that economic growth has a low level of data variation. The remittance variable (REM) has a standard deviation value of .4423992 (below the average). It means that remittances have a low level of data variation. The consumption variable (CON) has a standard deviation value of 3.814413 (below the average), which means that consumption expenditure has a low level of data variation. The investment variable (INV) has a standard deviation value of 4.627732 (below the average), which means that the investment has a low level of data variation.

**Table 2.** Variable Description Statistics

Variable	Mean	Dev. Std	Min	Max
GROWTH	-.0764627	3.687602	-13.12673	8.220007
REM	.7979491	.4423992	.1114713	1.895843
CON	69.84249	3.814413	64.48203	80.54825
INV	27.6031	4.627732	19.42916	32.81193

Source: processed data

**Table 3.** Variable Description Statistics

Variable	Mean	Dev. Std	Min	Max
lnER	8.822827	.7176964	7.519049	9.563595
lnREM	21.5237	1.394421	18.68304	23.17998
lnRES	24.42804	.8803984	22.88161	25.59245
lnAID	20.59178	1.020221	18.04976	21.63515

Source: processed data

**Table 4.** Causality Test (Granger Causality Test)

Variable	Chi <sup>2</sup>	Prob > Chi <sup>2</sup>
REM to GROWTH	1.061	0.588
GROWTH to REM	.48594	0.784
CON to GROWTH	.77303	0.679
GROWTH to CON	61.07	0.000
INV to GROWTH	6.1367	0.046
GROWTH to INV	11.539	0.003

Source: processed data

Table 3 shows a statistical description for Equation 2, which shows that the exchange rate variable (ER) has a standard deviation value of .7176964 (below the average). It means that the exchange rate has a low level of data variation. The remittance variable (REM) has a standard deviation value of 1.394421 (below the average), which means that remittances have a low level of data variation. The foreign exchange reserve variable (RES) has a standard deviation of .8803984 (below the average), which means that foreign exchange reserves have a low level of data variation. The foreign aid (AID) variable has a standard deviation value of 1.020221 (below the average), which means that foreign aid has a low level of data variation.

### Data Analysis

Table 4 shows the results of the Granger causality test, which is useful for knowing the dependence relationship between variables. It does not always mean having a causal relationship. The REM variable shows no significant effect on the GROWTH variable. The GROWTH variable shows significant results that do not affect the REM variable. Hence, it can be concluded that there is no unidirectional or bidirectional causality relationship between variables. The CON variable shows no significant effect on the GROWTH variable. The GROWTH variable shows significant results in influencing the CON variable. Therefore, it can be concluded that there is only a

one-way causality relationship between variables. The INV variable shows a significant effect on the GROWTH variable. The GROWTH variable also shows significant results in influencing the INV variable. Thus, it can be concluded that there is a two-way causality relationship between variables.

Table 5 displays the results of the vector error correction model. It shows the short-term and long-term relationship of each variable to the dependent variable. The results of the short-term relationship show that no variables significantly affect the GROWTH variable, whether REM, CON, or INV variables. Meanwhile, in the long term, there is only the CON variable that has an effect on the GROWTH variable.

Table 6 shows the results of the Granger causality test, which is useful for knowing that the dependence relationship between variables does not always mean having a causal relationship. The lnREM variable shows a significant effect on the lnER variable. The lnER variable shows significant results that do not affect the lnREM variable. Hence, it can be concluded that there is only a unidirectional causality relationship between the variables. The lnRES variable shows

a significant effect on the lnER variable. The lnER variable shows significant results that do not affect the lnRES variable. Therefore, it can be concluded that there is only a unidirectional causality relationship between the variables. The lnAID variable shows no significant effect on the lnER variable. The lnER variable shows significant results in influencing the lnAID variable. Hence, it can be concluded that there is only a unidirectional causality relationship between variables.

Table 7 shows the vector error-correction model, which is the short-term relationship results. This shows that the lnREM and lnAID variables do not significantly affect the lnER variable. Meanwhile, the lnRES variable significantly affects the lnER variable in the short term. In the long run, the table above shows that the lnRES and lnAID variables have an effect on the lnER variable. Meanwhile, the lnREM variable does not affect the lnER variable.

### *Hypothesis Testing and Discussion*

Remittances have no causal relationship with economic growth in Indonesia. Moreover, they have also been shown to have no effect on economic growth

**Table 5.** *Vector Error Correction Model*

Variable	Short-term			Long-term		
	Koef.	Std. Error	P> z	Koef.	Std. Error	P> z
_ce1	-.9864773	.3443657	0.004			
<b>GROWTH</b>	-.0851565	.2214474	0.701	1	.	.
<b>REM</b>	2.79028	2.609049	0.285	4.331835	2.427567	0.074
<b>CON</b>	-.0960632	.2929545	0.743	-.8265089	.2470423	0.001
<b>INV</b>	.2313031	.6510794	0.722	-.3980881	.3172121	0.209
<b>Cons</b>	.434566	.9964894	0.965	-.2088391	.	.

*Source: processed data*

**Table 6.** *Causality Test (Granger Causality Test)*

Variable	Chi <sup>2</sup>	Prob > Chi <sup>2</sup>
lnREM to nER	5.9769	0.050
lnER to lnREM	4.7787	0.092
lnRES to lnER	8.1753	0.017
lnER to lnRES	1.9336	0.380
lnAID to lnER	.60661	0.738
lnER to lnAID	10.702	0.005

*Source: processed data*

**Table 7.** *Vector Error-Correction Model*

Variable	Short-term			Long-term		
	Koef.	Std. Error	P> z	Koef.	Std. Error	P> z
<b>_ce1</b>	-.0007267	.1034289	0.994			
<b>lnER</b>	-.3466871	.1888978	0.066	1	.	.
<b>lnREM</b>	-.3130216	.2902541	0.281	-.6033498	.6641074	0.364
<b>lnRES</b>	1.097643	.3587039	0.002	-3.51312	1.43125	0.014
<b>lnAID</b>	-.0005164	.1061305	0.996	1.443009	.2380055	0.000
<b>Cons</b>	.0004174	.0701267	0.995	.8465448	.	.

Source: processed data

in either the short or long term. This is in accordance with Mincer's (1974) theory of the human capital model, where the model explains that wages can be influenced by education level, migration, and worker background. The data from Badan Nasional Penempatan Dan Perlindungan Tenaga Kerja Indonesia (2019) stated that, in Indonesia, the number of undergraduate or diploma graduates migrating abroad is still small. This is even far below the number of migrant workers with an educational background of high school, junior high, and even elementary education. The background of the low level of education possessed by migrant workers affects the size of the wages they receive. Hence, it will also affect the level of remittances that enter Indonesia. Although it is increasing every year, the contribution of remittances to Indonesia's GDP growth is small (below 2%). Therefore, it can be considered that remittances have little influence on Indonesia's economic growth. Another result found is that there is a two-way causality, which is that investment affects economic growth and vice versa because the level of investment in Indonesia is increasing every year. When investment increases, the growth will also increase. When growth increases, the income will also increase. Thus, more people will invest their money.

Remittances significantly affect the exchange rate. However, neither a short-term nor long-term relationship between remittances and exchange rates is found. The number of remittances that enter Indonesia so far is still relatively small and does not vary each year. Hence, it has little effect on the rupiah's exchange rate. High exports and foreign debt increase the country's foreign exchange reserve, thus affecting the strengthening exchange rate. Significant and positive short-term and long-term relationships are also found

in the reserves variable to the exchange rate. There is a significant and positive long-term relationship between foreign aid and the Indonesian exchange rate, but no short-term relationship is found.

## Conclusions and Suggestions

Remittances do not have a causal relationship with economic growth in Indonesia, which means that they do not significantly affect each other. Remittances have also proven to have no effect on Indonesia's economic growth in either the short or long term. Remittances have been shown to significantly affect the exchange rate. However, neither a short-term nor long-term relationship between remittances and exchange rates is found. This is because the number of remittances entering Indonesia is still relatively small. Hence, it is not able to support economic growth and the Indonesian exchange rate. The background of the low level of education possessed by migrant workers affects the size of the wages they receive, affecting the number of remittances that enter Indonesia.

Although it is increasing every year, the contribution of remittances to Indonesia's GDP growth is small (always below 2%). However, this does not reduce the importance of remittances to the Indonesian economy. Remittances received by families in the country of origin are one of the sources of household income. This research can be used as an illustration to see how big the contribution of foreign workers' remittances is to economic growth and Indonesia's exchange rate. Although the number of migrations out of Indonesia is quite high due to education and other factors, wages by workers sent to the country as a form of foreign exchange flow are still not enough to support economic

growth. Moreover, it strengthens Indonesia's exchange rate. This study has limitations, including the lack of in-depth research analysis, such as the gap variable that can support this research.

With this research, the government is expected to be able to take policies to help improve the quality of human resources so that Indonesia can become a labor-sending country with superior skills and expertise. Moreover, it can compete with other countries. Education and training programs for prospective workers need to be improved to overcome the problem of competitiveness in the international arena. Without being equipped with the ability and highly competitive advantage, Indonesia's position will be marginalized in the competition. Remittances of migrant workers must also be regulated with a good policy strategy. This policy must be implemented to improve the remittance infrastructure. More attention should be paid to institutions or services dealing with migrants and remittances. Hence, the remittances that enter Indonesia can be allocated more efficiently.

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