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Dynamic of Economic Motives of Indonesia's Migrant Workers' Remittances

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Abstract: This study investigates empirical evidence regarding the economic motives underlying remittances from Indonesian migrant workers. Economic motives play a crucial role in remittances behavior, as they determine the amount of money workers send to their families in their home country based on various economic indicators. Although extensive research exists on this topic, there remains no definitive consensus about the economic motivations behind migrant workers' remittances. This research provides additional perspectives on these economic motives, particularly in the Indonesian context. Using a fixed effects model to overcome individual effect bias, this study finds evidence of investment motives in Indonesian's migrant workers' remittances. However, these findings are contingent upon Indonesia's economic condition. The motivations tend to be individualistic during periods of economic stability and altruistic during economic uncertainty. The knowledge gained from understanding these economic motives can help related parties formulate strategies for economic activities involving migrant workers' remittances in accordance with Indonesia's economic conditions.
Keywords: Altruism; Migration; Remittance
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Introduction

The first comprehensive research on the economic motives behind migrant workers' remittances was conducted by Stark and Lucas (1985). They expanded the common assumption that altruistic motives were the primary factor driving remittances, which had been prevalent in previous studies, to include self-interest as a significant factor. Furthermore, Stark and Lucas (1985) also considered the possibility of interaction between these two motives, resulting in a mutualistic relationship between migrant workers and their families in the home country.

The theoretical model of this concept was further developed by Rapoport and Docquier (2006). They categorized these motives into two groups: individual and family motives. In the case of individual motives, the decision regarding the amount of remittances is made by the migrant workers themselves. In contrast, family motives are based on a contractual relationship between migrant workers and their families.

According to Rapoport and Docquier (2006), there are at least seven economic motives that may underlie migrant workers' remittances: altruistic, exchange, strategic, insurance, loan repayment, inheritance, and mixed motive. However, this study focuses on three main motives for migrant workers' remittances: altruistic, self-interest, and loan repayment. This limitation arises because the variables used in the macroeconomic approach are quite restricted and do not adequately capture the socio-demographic diversity that influence variations in motives at the household level.

Empirically, extensive research has been conducted to identify the economic motives behind migrant workers' remittances. Generally, these studies can be divided into two groups. The first group employs a microeconomic approach, utilizing data at the household level (Stark & Lucas, 1985; Yang & Choi, 2007). In contrast, the second group adopts a macroeconomic approach, using data at the country level (Mughal & Ahmed, 2014; Azizi, 2018; Yoshino, Taghizadeh-Hesary, & Otsuka, 2020; Shastri, 2022). The choice of approach depends on data availability; if micro data are accessible, a microeconomic approach is preferable, and vice versa.

Stark and Lucas (1985) conducted one of the first studies utilizing the microeconomic approach to examine this motive in Botswana. Using data from the National Migration Study of Botswana in 1978 - 1979, they found a combination of altruistic and self-interest motives driving migrant workers' remittances in Botswana. To illustrate this phenomenon, they introduced terms such as "tempered altruism" or "enlightened self-interest".

Another study was conducted by Yang and Choi (2007) in the Philippines. Utilizing rainfall as an instrumental variable for migrant workers' family income, they found that remittances sent by migrant workers serve as a form of insurance for their families in the Philippines during external shocks that negatively affect household income. This mechanism was shown to secure nearly 60% of the family income in the event of adverse external shocks.

In contrast to the micro-level analyses, macro-level studies of the economic motives behind migrant workers' remittances are relatively limited. Typically, research using this approach focuses on two main motives: altruism and self-interest. These studies often rely on Gross Domestic Product (GDP) per capita as a proxy for the income migrant workers and their families.

Utilizing the economic motives model of remittances model developed by Rapoport and Docquier (2006), Azizi (2018) identified altruism as the dominant motive behind remittances behavior[1]. However, altruism itself does not fully explain the behavior; instead, a combination of altruistic and self-interested motives appears to drive

[1] This research used 192 observations at country level data in 1990 - 2015.

remittance pattern[2]. Due to its macro-level approach, Azizi's (2018) study was unable to identify the specific economic motives that fully remittances activity.

While the macro approach has limitations in uncovering specific, it effectively highlights the cyclical relationship between remittances and home-country economies. Focusing on India, Pakistan, Sri Lanka, and Bangladesh from 1975 to 2011, Mughal & Ahmed (2014) found that remittances in India and Pakistan are countercyclical to their economies, whereas they are procyclical in Sri Lanka and Bangladesh.

Beyond traditional factors explaining remittance motives, recent research has begun incorporating infectious diseases as control variables (Shastri, 2022). For example, Shastri (2022) examined the infectious disesases outbreak in India and found that such outbreaks negatively affect remittance flows. However, remittances also function as a source of economic resilience during crises caused by these outbreaks. Despite these findings, no theoretical model currently exists to explain the transmission mechanism between infectious diseases and remittance levels.

This perspective aligns with the findings of Kpodar et al. (2023), whoanalyzed monthly data from 52 countries during the JanuaryDecember 2020 period. They observed that remittances increased as COVID-19 infection rates rose in migrant workers' home countries. Consistent with Shastri's (2022) finding, Kpodar et al. (2023) also emphasized that remittances serve as an economic shock absorber, particularly in developing countries.

Other than this traditional approach, which only consider migrant workers family and their own income as main economic factors in remittances, several studies have explored alternative influences, such as the level of democracy (Makhlouf, 2024) and population aging (Jounghyeon, 2023). However, due to the lack of a robust theoretical framework supporting these relationships, this study focuses on the traditional approach to assess the economic motives of remittances sent by Indonesian migrant workers.

Despite the extensiveresearch conducted on this topic, no study has specifically focused on identifying the economic motives behind remittances sent by Indonesia's migrant workers.According to Stark and Lucas (1985), for remittances depend on various factors, including the migrant workers' country of origin. Therefore, the main purpose of this research is to address the knowledge gap regarding the economic motives behind the remittances of Indonesia's migrant workers.

In addition, this study will explore the potential of dynamics of these economic motives over time. To the best of the author's knowledge, this aspect has not been examined in any research on the economic motives of migrant workers''remittances. Most studies in this field have been conducted under the assumption that economic motives remain static

[2] It is because Azizi (2018) not found enough evidence to justify pure-altruistic condition of migrant workers remittance which characterized by $\frac{\partial R^*}{\partial Y_m} - \frac{\partial eR^*}{\partial Y_f} = \beta_m + (1 - \beta_m) = 1$.

over time. In contrast, this research will test whether the economic motives of Indonesia's migrant workers' remittances vary under different economic conditions.

Furthermore, this study adopts a macroeconomic approach, given that data on Indonesia's migrant workers' remittances is only available at the national level. While this approach introduces challenges to identifying the economic motives behind remittances, it also enables the investigation of the cyclical relationship between Indonesia's migrant workers' remittances and the broader Indonesian economy over an extended period.

Research Method

This research will be conducted quantitatively using country-level data. A key challenge with this approach is the ability to study microeconomic phenomena using macroeconomic variables. To address this issue, the research will employ macroeconomic variables at the individual level – such as GDP per capita or remittance per migrant workers.

The main sources of data for this research are Statistik Ekonomi Keuangan Indonesia (SEKI) from the Central Bank of Indonesia and the World Development Indicators (WDI) from the World Bank. These data sets record the remittances of Indonesian migrant workers from 27 countries between 2006 and 2022, amounting to 459 observations in the form of panel data. However, since these data sets only account for remittances sent through formal channels, there is a possibility that the data used in this research may be undervalued.

At least six variables need to be considered in analyzing the motives behind migrant workers' remittances. , These include the amount of migrant workers' remittances, their income in host countries, their families' income in home countries, the real exchange rate between host and home countries, and the real interest rate in the home countries (Azizi, 2018). Additionally, infectious disease outbreaks must be considered, as studies have shown that these events significantly impact the amount of migrant workers' remittances (Shastri, 2022). Since micro-level data is unavailable, this research will use macro-level data as proxies for these six variables.

Table 1 List of operational variables

Theoretical Variable	Operational Variable	Unit	Source
R	Personal transfer per migrant workers	Constant $US (base year 2015)	SEKI
Y_h	Indonesia GDP per capita	Constant $US (base year 2015)	WDI
Y_m	Migrant workers host countries GDP per capita	Constant $US (base year 2015)	WDI
e	Average of real exchange rate	Rp / $US (real)	WDI
Real interest rate	Indonesia real lending rate	Percent	WDI
Infectious disease	Dummy of Covid-19	Dummy	WHO

The main issue in empirically testing the economic motives for migrant workers' remittances is the unobserved individual effect, which has a high potential to influence the level of migrant workers' remittances[3] (Azizi, 2018). If this effect is not controlled omitted variable bias may arise, potentially rendering the empirical estimation inaccurate (Wooldridge, 2016). To mitigate this issue, the research will use the fixed effect regression method, which addresses unobserved individual effects through time-demeaned data transformation.

Statistical tests conducted by the author also demonstrate the superiority of the fixed effect model over other models. According to the Chow test, the fixed effect model is preferable to the common effect model (Prob > F = 0.0000). Additionally, the Hausman test confirms that the fixed effect model is preferable to the random effect model (Prob > Chi² = 0.0479). Therefore, this research employs the fixed effect model.

The fixed effect model is a transformation of Ordinary Least Squares (OLS) that retains unobserved individual effects. The transformation process is as follows:

$$\ln(R)_{it} = \alpha_i + \beta_1 \ln(Y^h)_t + \beta_2 \ln(Y^m)_{it} + \beta_3 \ln(e)_t + \beta_4 r_t + \beta_5 D_t + \mu_{it} \quad (1)$$

$$\overline{\ln(R)}_i = \alpha_i + \beta_1 \overline{\ln(Y^h)} + \beta_2 \overline{\ln(Y^m)}_i + \beta_3 \overline{\ln(e)} + \beta_4 \bar{r} + \beta_5 \bar{D} + \bar{\mu}_i \quad (2)$$

$$\begin{aligned} \ln(R)_{it} - \overline{\ln(R)}_i &= \beta_1 \left[\ln(Y^h)_t - \overline{\ln(Y^h)}\right] + \beta_2 \left[\ln(Y^m)_{it} - \overline{\ln(Y^m)}_i\right] \\ &\quad + \beta_3 \left[\ln(e)_t - \overline{\ln(e)}\right] + \beta_4 [r_t - \bar{r}] + \beta_5 [D_t - \bar{D}] + [\mu_{it} - \bar{\mu}_i] \end{aligned} \quad (3)$$

$$\ln(\ddot{R})_{it} = \beta_1 \ln(\ddot{Y}^h)_t + \beta_2 \ln(\ddot{Y}^m)_{it} + \beta_3 \ln(\ddot{e})_t + \beta_4 \ddot{r}_t + \beta_5 \ddot{D}_t + \ddot{\mu}_{it} \quad (4)$$

$$\widehat{\ln(\ddot{R})}_{it} = a_0 + \beta_1 \ln(\ddot{Y}^h)_t + \beta_2 \ln(\ddot{Y}^m)_{it} + \beta_3 \ln(\ddot{e})_t + \beta_4 \ddot{r}_t + \beta_5 \ddot{D}_t + \widehat{\ddot{\mu}_{it}} \quad (5)$$

In equation (1), the unobserved individual effect component (α_i) that appeared in equation (3) has been eliminated through the fixed effect transformation process.

Another issue in the empirical model of this study is the potential problem of simultaneity bias between the GDPs per capita variables of the home country and migrant worker remittances (Azizi, 2018). However, research on the relationship between GDPs per capita of the home country and remittances of migrant workers in Indonesia indicates that there is no causal relationship between these two variables (Annisa & Jayadi, 2024). This is because remittances represent only a small percentage of Indonesia's GDP, accounting for merely two to three percent.

The total number of observations in this research is 459 samples, drawn from 27 countries over a 17-year period (2006–2022). However, during this period, nine host countries lack

[3] For example, consider the difference in remittance levels of Indonesian Migrant Workers (PMI) working in Germany and Malaysia. This difference is likely due to the varying skill levels between PMIs working in Germany and Malaysia, where PMIs in Germany generally have higher skills compared to those in Malaysia, resulting in higher wages for PMIs in Germany than in Malaysia.

records of migrant workers remittances[4]. As a result, the total number of observations that can be included in the empirical model estimation is reduced to 411.

Table 2 Statistical Summary

Variable	Mean	Min.	Max.	Observation		
				Overall	Between	Within
Remittances / migrant workers	4,087	778	27,398	411	27	15,22
GDP per capita of the home country	3,223	1,495	3,940	459	27	17
GDP per capita of the host countries	33,251	560	102,640	459	27	17
Real exchange rate	13,422	9,819	19,482	459	27	17
Real interest rate	4.89	-4.55	9.95	459	27	17
Covid-19	0.17	0	1	459	27	17

Source: WDI & SEKI Bank Indonesia (processed by the author)

Table 3 Data Distribution

Variable	Quartile 1	Quartile 2	Quartile 3	Variance	S.D	Kurtosis
Remittances / migrant workers	1,823	3,087	4,744	14,394,743	3,794	12.92
GDP per capita of the home country	2,467	3,554	3,816	593,118	770	-0.40
GDP per capita of the host countries	18,775	34,597	46,142	415,171,520	20,376	-0.02
Real exchange rate	12,215	13,499	14,008	4,940,586	2,223	1.16
Real interest rate	2.60	6.69	8.04	17.27	4.16	-0.36
Covid-19	0	0	0	0.14	0.37	1.22

Source: WDI & SEKI Bank Indonesia (processed by the author)

Remittances per migrant workers vary significantly across host countries. The highest remittance recorded in this research was $27,398 per year in 2020, with South Korea as the host country. In contrast the lowest remittance was $778 per year in 2010, with Cyprus as the host country, . The average remittance across all observations is $4,087 per year.

An interesting finding from this research is that the average remittance exceeds Indonesia's GDP per capita, which is only $3,223 per year [5]. This suggests that working abroad can be a viable option for Indonesian migrant workers to improve their standard of living.

In addition to these variables, the GDP per capita of the host country for Indonesian migrant workers also shows significant variation. Similarly, Indonesia's real exchange rate and real interest rate fluctuated greatly during the observation period. This variation and volatility in the data provide a valuable context for this research to explore how migrant workers respond to macroeconomic dynamics in determining the amount of remittance (Wooldridge, 2016).

[4] Australia (2006), Egypt (2006 - 2012 and 2021), Cyprus (2006 - 2008), Sudan (2006 - 2013 and 2018 - 2022), South Africa (2006 - 2007), Netherland (2006 - 2010 and 2017 - 2022), Italy (2006 and 2009 - 2010), France (2006 - 2011), and Spain (2006).

[5] Examination with t-test found that there is significance difference between these two variables.

Table 3 Statistical summary (regionally)

Region	Remittance / migrant workers			Host country GPD / capita		
	Min.	Mean	Max.	Min.	Mean	Max.
AFRICA	823	3,387	9,901	5,283	6,972	9,318
AMERICA	4,574	12,263	27,147	51,996	56,304	62,867
ASEAN	1,148	2,207	6,073	6,624	32,878	68,425
ASIA (exclude ASEAN)	2,118	5,213	27,398	2,098	34,606	91,783
AUSTRALIA & OCEANIA	2,218	6,477	16,333	41,229	54,343	71,239
EUROPE	823	5,211	16,458	24,152	41,462	64,177
THE MIDDLE EAST	778	2,321	7,357	560	25,973	102,640

Source: WDI & SEKI Central Bank of Indonesia (processed by the author)

Regionally, there are significant differences in remittance per migrant worker and GDP per capita across the host countries of Indonesian migrant workers. This underscores the need for the fixed effect estimation method in this study. The fixed effect estimation method can address individual effects that cause differences in remittance values per migrant worker across different host countries.

Result and Discussion

Statistically, the average of remittance per migrant worker is higher than the average GDP per capita in Indonesia. This observation suggests that working abroad is a viable option for Indonesian migrant workers to improve their standard of living. However, this arises an important question: if Indonesian migrant workers are working abroad and sending remittances, what are the economic motives behind these remittances?

Table 4 Empirical model regression

	PLS	FE	FE - COVID	FE - NON COVID
$\ln(Y^h)_t$	**1,14*****	**1,33*****	**-2,89***	**1,39*****
	(4,31)	(7,86)	(-2,26)	(8,22)
$\ln(Y^m)_{it}$	**0,29*****	-0,18	**1,31****	**-0,24***
	(7,75)	(-1,53)	(3,04)	(-1,96)
$\ln(e)_t$	**1,61*****	**1,59*****	0,06	**1,66*****
	(4,07)	(6,24)	(0,02)	(6,96)
r_t	0,01	**0,01***		0,01
	(1,46)	(2,26)		(1,06)
D_t	-0,20	**-0,25*****		
	(-1,75)	(-3,35)		
_cons	**-19,37*****	**-15,90*****	18,08	**-16,53*****
	(-3,49)	(-4,13)	(0,39)	(-4,38)
N	411	411	74	337
R^2	0,19	0,26	0,24	0,34
Fixed Effect	No	Yes	Yes	Yes

t statistics in parentheses
* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$

Theoretically, various economic motives could underline the remittances of Indonesia's migrant workers, and this research has defined and examined these motives. To delve deeper into this subject, this section discusses the results of the empirical model estimation outlined earlier in the study.

Based on the regression results, the study identifies a tendency for self-interest as a driving motive for Indonesia's migrant workers remittances. However, this motive appears to operate independently of the migrant worker's family as an economic agent in the home country. This finding differs from Azizi (2018) regarding the independence of migrant workers in wealth management. In general, the results indicate a pure self-interest motive behind Indonesia's migrant workers' remittances. Specifically, remittances are predicted to increase by approximately 1.3302 percent, 1.5967 percent, and 0.012 percent with a one percent increase in Indonesia's GDP per capita, real exchange rate, and real interest rate, respectively, ceteris paribus. These results suggest that Indonesian migrant workers tend to maximize their wealth in the home country by increasing money transfers when returns are higher, vice versa.

Furthermore, the significant and positive influence of Indonesia's real exchange rate and real interest rates on remittance levels underscores the independence of Indonesian migrant workers in managing their wealth in the home country. This behavior indicates a preference for accumulating wealth through financial instruments, which can be managed independently of family members as economic agents in Indonesia.

Regarding infectious diseases, proxied in this study by the COVID-19 outbreak, the results reveal a negative and significant impact on Indonesian migrant workers' remittances (Kpodar et al., 2023; Shastri, 2022). This outcome aligns with expectations, as policy responses to the COVID-19 pandemic, such as lockdowns, severely disrupted business activities. These disruptions affected the income levels of Indonesian migrant workers in their host countries, ultimately leading to a decline in remittance levels.

One intriguing finding from the regression results is the insignificant impact of the host country's GDP on the level of Indonesia's migrant workers remittances. The GDP per capita of the host country, serving as a proxy for income levels in the host country, is theoretically expected to have a positive and significant effect on remittance levels (Azizi, 2018). However, this is not the case in this study.

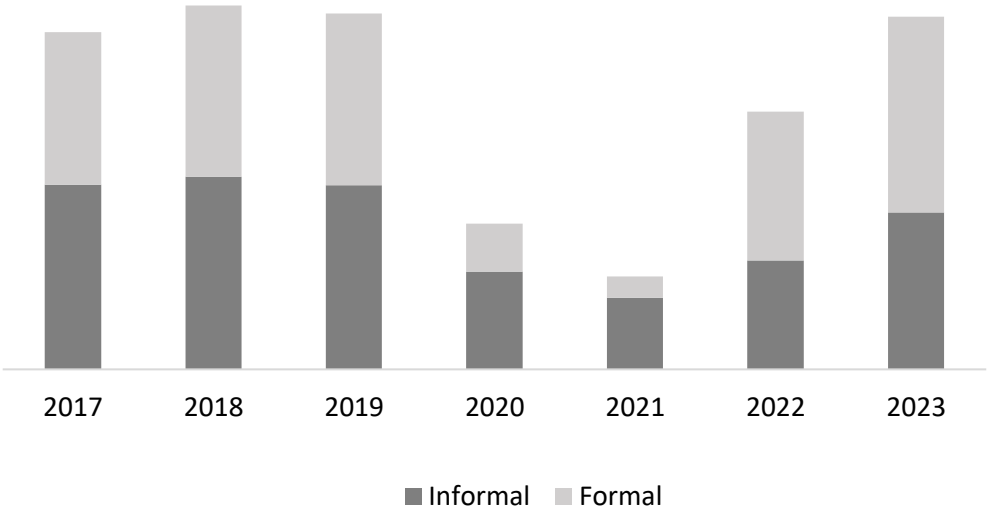

Figure 1 Indonesia's migrant workers working sector.
Source: BP2MI

It is important to note that the GDP per capita is a reliable proxy for income levels in the formal sector, as it is measured based on formal economic activities (Mankiw & Taylor, 2020). However, the majority of Indonesian migrant workers work in the informal sector in their host countries (BP2MI, 2024). Therefore, it is reasonable that economic developments in host countries do not significantly influence their remittances.

Based on these findings, new questions will certainly arise regarding the motives behind Indonesian migrant workers remittances that tend to self-interest rather than altruistic. Conventional wisdom suggests that Indonesian migrant workers typically migrate to support their families' economies in the home country. According to this research, two key factors contribute to the economic motives of Indonesian migrant workers' remittances: the relatively lower economic standard and the economic stability in Indonesia.

When the Indonesian economy is stable, remittances are driven by self-interest motives. However, this does not mean that remittances are not used to assist families in Indonesia. Indonesian migrant workers continue to send money to support their families. Nevertheless, as seen in Table 2, Indonesia's GDP per capita, at approximately $3,223, is significantly lower than the average remittance per migrant worker, which is around $4,087 per year. This gap allows migrant workers to allocate a portion of their remittances for investment in their home country.

In contrast, during periods of economic instability in Indonesia, the motives behind remittances tend to shift towards altruism. This is evident from a comparison of regression results for the COVID-19 period (when the Indonesian economy was unstable) versus the pre-COVID period (when the economy was stable). Thus, the economic motives of Indonesian migrant workers' remittances are dynamic and context-dependent.

Further testing was conducted to confirm this phenomenon in the economic motives behind remittances. An additional empirical strategy introduced a time dummy variable for periods when the Indonesian economy was in a downturn. Furthermore, interaction terms between the dummy variables for "Downturn" and "COVID" with Indonesia's GDP per capita were also included. The coefficients of these interaction terms reveal patterns in the relationship between Indonesia's GDP per capita and remittances per migrant worker during these two periods.

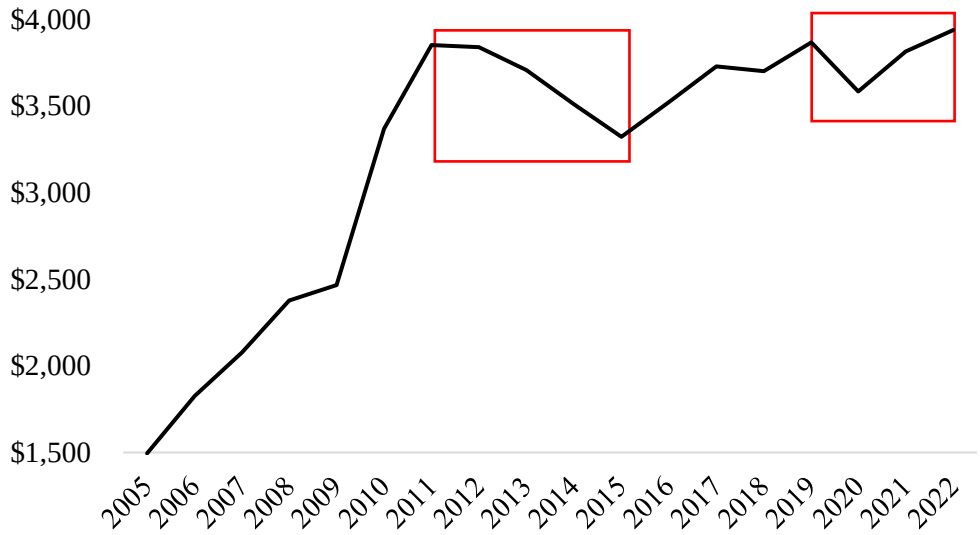

Figure 2 Indonesia GDP per capita.
Source: WDI

Table 6 Empirical model regression (continued)

	(1)	(2)	(3)
$Covid_t$	-0,06	19,88	-1,16
	(-0,82)	(1,42)	(-0,08)
$Downturn_t$	**40,35*****	0,07	**40,49*****
	(5,51)	(1,00)	(5,31)
$\ln(Y^h)_t * Covid_t$		-2,45	0,13
		(-1,43)	(0,08)
$\ln(Y^h)_t * Downturn_t$	**-4,95*****		**-4,96*****
	(-5,51)		(-5,31)
_cons	-1,61	**-24,72*****	-1,29
	(-0,30)	(-4,90)	(-0,20)
N	411	411	411
R^2	0,30	0,25	0,31
Fixed Effect	Yes	Yes	Yes

t statistics in parentheses
* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$

The conclusion of the empirical model regression results by adding these two interaction variables is in accordance with our assumptions. The results of this test indicate that when the Indonesian economy is unstable, the economic motives of Indonesia's migrant workers remittances tend to be altruistic.

Conclusion

The main focus of this research is to identify the economic motives behind the remittances of Indonesian migrant workers. The results of this analysis indicate a tendency towards self-interest as the dominant motive for these remittances. However, this self-interest motive operates independently and does not rely on the migrant worker's family as the economic agent in the home country.

This study presents findings that differ from Azizi (2018) regarding the economic motives formigrant workers' remittances. Azizi (2018) identified mixed motives for remittances, with altruistic as a dominant motive. This can be happened because the dataset used by Azizi (2018) is not focus on a single country, thereby introducing significant heterogeneity due to variations in cultural and economic conditions among migrant workers from different countries of origin.

This study also identified changes in the economic motives of migrant workers' remittances during periods of economic instability in Indonesia. When the Indonesian economy was stable, the economic motives for remittances tended to align with self-interest. In contrast, during periods of economic instability, these motives shifted toward altruism. This finding is aligned with the observations of Stark and Lucas (1985) in Botswana, who used the term "tempered altruism" or "enlightened self-interest" to describe similar patterns in the economic motives of migrant workers' remittances.

One of the significant contributions of this research is its demonstration of the dynamic nature of the economic motives for migrant workers' remittances over time. To the best of the author's knowledge, this dynamic aspect has not been addressed in previous studies on this topic. Therefore, we highly recommend that future research on this subject include an exploration of the temporal dynamics of these economic motives to provide a more comprehensive understanding.

Finally, one of the main challenges in identifying the economic motives of Indonesian migrant workers' remittances is the lack of household-level data. While this challenge can be partially addressed using a macroeconomic approach, the insights generated by such an approach are not as precise as those obtained from a microeconomic perspective. Hence, this study's main recommendation is to prioritize the collection household-level data on migrant workers' remittances.

Collecting household-level data through surveys can also address potential selection bias in this study. This approach would capture remittance transfers through both formal and informal channels, ensuring that the data better represent all migrant workers, regardless

of their characteristics. Such comprehensive data collection would enhance the reliability and depth of future research on this topic.

Author Contributions

Conceptualisation, A. and M.E.; Methodology, A. and M.E.; Investigation, A.; Analysis, A. and M.E.; Original draft preparation, A.; Review and editing, A.; Visualization, A. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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