

An Analysis of Relationship Between Remittances and Imports of Nepal

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Abstract

Background: The remittance has become one of the main sources of foreign exchange and it has brought significant and structural changes in the economy of Nepal. Similarly, Nepal has had a significant trade imbalance for many years. These two variables are most contentious topics in this decade.

Objectives: In this context, the paper has examined the impact of remittance inflows on import in Nepalese economy. Method: A suitable econometric model was developed by including the major sources of foreign exchange i.e. export, foreign assistance, and tourist earnings together with remittance in the explanatory variables. The necessary data were obtained from the official website of NRB from the years 2000/01 to 2021/22, and then the stationarity of the variables was tested. Based on the results of the stationarity test, a suitable ARDL model was then applied to measure the long- and short-term effects of the explanatory variable.

Results: The study's findings revealed that remittances and the lagged import were main variables to determine the size of import. Both variables had a positive impact on imports, but other factors i.e. tourist earning, export and foreign assistance had an insignificant impact over response variable.

Conclusion: The study indicates that the hypothesis was accurate. It means when remittance revenue rises in the economy, imports rise along with it. The primary cause of this is remittances have increased recipients' income and the domestic production hasn't increased significantly due to an increase in absenteeism. As a result of mismatch between rising demand and stagnant supply, the import volume has increased.

Keywords: Export, Foreign assistance, Import, Remittance, Tourist earnings.

1 Introduction

International labor migration refers to the movement of people across international borders in the search of employment. It has become one of the most contentious macroeconomic issues in the globe. Since Nepal's liberalized policy in 1985, with a focus on foreign employment, the nation has experienced a significant increase in labor migration, particularly after 1990 (Kaphle, 2018). The World Bank (2018) defines remittance broadly as the sum of personal transfers and compensation of employees, essentially referring to the earning of workers in abroad. Remittance has become a key source of foreign exchange for many low and middle-income countries (LMICs) showing a significant upward trend. In 2022, remittances to these countries totaled \$630 billion, marking a 4.2 percent increase from the previous year and have represented 0.66 percent of the global GDP of \$95 trillion (World Bank, 2022). Remittance is now as essential as foreign direct investment, official development assistance, and international trade for development. Remittances to LMICs are over three times the size of official aid and surpass foreign direct investment (World Bank, 2019). Remittance inflows to developing countries are more than twice official aid and nearly two-thirds of foreign direct investment (Meyer & Shera, 2016).

In Nepal, the rate of job creation is lower than the influx of labor into the market. Remittances have therefore grown to be a heavily debated economic, political, and social issue. Consequently, Nepal has become one of the primary labor suppliers to both developing and industrialized nations. Remittance inflows in Nepal surged dramatically from NPR 9797.6 million in 2000/01 to NPR 868551.749 million in 2021/22, with the remittance-to-GDP ratio rising from 10.69 percent to 20.4 percent peaking at 28 percent in 2018 (MoF, 2023). This made Nepal the world's fifth largest receiver of remittance by GDP ratio (WB, 2018). The inflow of remittances has had a significant positive impact on Nepalese economy. It has compensated for imports and enhanced the skills of non-skilled and semi-skilled labor and fostered economic growth. Remittances have also helped to alleviate poverty and economic stagnation, enabling the economy to survive despite downturns in other sectors and improved living standard of the people (Sah, 2019 and Vacaflores, 2018). Therefore, remittances are becoming a vital macroeconomic component for many developing countries like Nepal. Despite these benefits, the phenomenon of absentee population due to foreign employment remains a major demographic, social, and economic challenge. By February 2022, 5.662 million people had taken approval for foreign employment constituting 19.32% of the

total population. Increased absenteeism is to blame for weak GDP growth and productivity (O'Toole, 1980). Remittances exert dual effects in the national economy. On the one hand, remittance positively influence savings, investment, growth, consumption, poverty reduction and income distribution and significantly contributing to GDP. On the other hand, it has negative effects on the economy such as increasing imports and trade deficits, and imposing human and social costs. As a result, Nepal has been plagued by chronic trade deficit for several decades primarily due to limited export diversity, infant stage of industrialization, low level of investment, lack of competitiveness. Given these complexities, this paper examines the relationship between remittances mainly to the imports of Nepal. The specific objective of the study is to assess the relationship between the remittance income and imports.

2 Materials and Methods

The study is designed to examine the relationship between remittance and import of Nepal. The study has adopted the descriptive and analytical research design. In this study, import (M) was the outcome variable whereas remittance (REM), export (X), tourist earning (TE) and foreign aid (FA) were control variables. These control variables are the major sources of foreign exchange on which import is directly associated. The analytical model was developed as follows:

$$M = f(REM, X, TE, FA)$$

The study is based on secondary data which have been collected from various published material by Ministry of Finance, GON and Nepal Rastra Bank. Analysis was based on time series data of 2000/01-2021/22 and converted into real term through GDP deflator based on 2010/11.

In order to test the stationarity, Augmented Dickey Fuller unit root test was carried out, as explained by Asteriou and Hall (2007) as follows:

$$\Delta Y_t = \theta + \theta_1 t + \phi Y_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-1} + \mu_t \quad (1)$$

Where, Y_t is a time series variable, θ is a constant, θ_1 is the coefficient of time trend, ϕ is the coefficient of the lagged variable, β_i are the coefficients of the difference of the lagged variable, p is the lag order, and μ_t is a pure white noise error term.

The basic Autoregressive Distributed Lag (ARDL) model was employed by Pesaran, Shin, and Smith (2001) as the variables are stationary at mixed orders. The effect of explanatory variables on the dependent variable may or may not be measured instantly; sometimes it might take time. Thus, the ARDL approach of cointegration is an appropriate econometric method to capture the lagged effect of the explanatory variables on the dependent variable. All the variables are taken in natural logarithms. The basic model used for the estimation is specified as:

$$\ln M_t = \alpha + \beta_1 \ln REM_t + \beta_2 \ln X_t + \beta_3 \ln TE_t + \beta_4 \ln FA_t + \mu_t \quad (i)$$

Where, $\ln M_t$ = Import of Nepal expressed in logarithm

$\ln REM_t$ = remittance received in logarithm

$\ln X_t$ = Export of Nepal expressed in logarithm

$\ln TE_t$ = Tourist Earning expressed in logarithm

$\ln FA_t$ = Foreign Assistance including grant and loan in logarithm

a = Intercept

β_1 s = Respective coefficient

μ_t = Error term

Following Pesaran, Shin (1999) the optimal lag length is selected through the Schwarz information criterion (SIC) and equation of bound test cointegration is:

$$\begin{aligned} \Delta M_t = & \theta + \sum_{i=1}^p \alpha_i \Delta M_{t-i} + \sum_{i=1}^q \beta_i \Delta REM_{t-i} + \sum_{i=1}^q \gamma_i \Delta X_{t-i} \\ & + \sum_{i=1}^q \omega_i \Delta TE_{t-i} + \sum_{i=1}^q \phi_i \Delta FA_{t-i} + \tau_1 \Delta M_{t-1} + \tau_2 \Delta REM_{t-1} \\ & + \tau_3 \Delta X_{t-1} + \tau_4 \Delta TE_{t-1} + \tau_5 \Delta FA_{t-1} + \mu_t \end{aligned} \quad (2)$$

Where Δ denotes the first difference operator, θ is the intercept term, and μ_t is the error term. In the ARDL approach, $(\tau_1$ to $\tau_4)$ represent the long run relationship, whereas the remaining summation signs $(\alpha_i, \beta_i, \gamma_i, \omega_i, \phi_i)$ represent the short run dynamics of the model.

3 Results

Before moving on to regression, unit root test of each variable was conducted in order to test whether the data are stationary or not. Stationarity is important to avoid misleading parameter estimates of relationship between variables. If the regression is run under the non-stationary data, the regression result will be spurious. The results ADF test of the time series data is are presented in table.

3.1 ADF Unit Root Results

Table 1 indicates the results of ADF test. The examined results of ADF indicates that all variables are stationary either at level or at first difference i.e., none of the variables are stationary at second difference I (2), which confirms that the ARDL model can be applied. The basic assumption of ARDL model is that all variables will be stationary at level or at the first difference or both; the rationale behind this is to check that none of the variables are stationary at second difference.

Table 1: Results of Unit Root Test

Variables	Stationary at	ADF (p-value)	Includes
lnRM	Level	0.0154	Intercept and Trend
lnRREM	Level	0.0007	Intercept
lnRX	1 st difference	0.0087	None
lnRTE	Level	0.0416	Level
lnRFA	1 st difference	0.0000	Intercept and Trend

Sources: Authors' estimation in Eviews 12

3.2 Lag order selection criteria

Table 2: Result of lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	56.11851	NA	5.29e-09	-4.868430	-4.619734	-4.814456
1	139.9664	119.7827*	2.11e-11*	-10.47299*	-8.980815*	-10.14915*

* Indicates lag order selected by the criterion

Table 2 indicates the results of lag order selection criteria. Three different lag order selection methods were applied to select a suitable lag for the dependent and independent variables. In times series data, the AIC and SIC methods are the most popular. The suitable lag length is 1 because of the majority.

3.3 ARDL model for cointegration test

The results of ARDL method of cointegration test are presented in the Table 3. Here, the dependent variable is real import with 22 observations used for the estimation from 2000/01 to 2021/22.

Table 3: Result of ARDL Co-integration test

Long Run Coefficients for ARDL Approach				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRM(-1)	0.603677	0.153890	3.922782	0.0017
LNRREM	0.176176	0.069756	2.525614	0.0253
LNRTE	0.032676	0.047909	0.682047	0.5072
LOGRFA	0.009650	0.075248	0.128242	0.8999
LOGRFA (-1)	0.160472	0.092826	1.728742	0.1075
LNRX	0.276325	0.195336	1.414609	0.1807
LOGRX(-1)	-0.371766	0.204970	-1.813754	0.0929
C	0.855585	1.062646	0.805145	0.4352
R – squared 0.971717				
R – squared 0.971717				
F – statistic – 63.80677				
Prob (F- statistic) 0.000000				
Durbin-Watson Stat 1.969782				

Table 3 indicates the results of a ARDL model processed by Eviews 12. The coefficients of lnRREM, lnRX, lnRTE, lnFA represent long run coefficients. The coefficients of lnRTE, lnRFA and lnRX are not statistically significant while coefficient of lnRREM and lnRM(-1) is positive and statistically significant. The coefficient is 0.603677 which means that 60% import is associated with previous import. It means that 60% present import is the impact of previous import. The coefficient of RREM is 0.176176 which means that in the short run, 1% increase in remittance leads to 0.1761% increase in import. The R2 and adjusted R2 is 0.97 which means that 97% of the variation in dependent variable is explained by the independent variables.

3.4 Bound Test

Table 4 clears that the value of F statistics is more than the I(1), which means that the null hypothesis of no co-integrating relationship is rejected which implies that there exists long run relationship between the variables. To put it differently, it implies that the variables of the model have a tendency of moving together over time.

Table 4: Result of Bound Test

F – Statistics 4.698699		
Critical Value Bounds		
Significance	I(0) Lower Bounds	I(1) Upper Bounds
10%	2.2	3.09
5%	2.56	3.49
0.50%	2.88	3.87
1%	3.29	4.37

3.5 Cointegration and long run adjustment

Since the cointegration coefficient in Eq(-1) is negative with a value of -0.513476 in Table 5, this implies that the speed of adjustment toward the long-run equilibrium is 51.34%, or the system corrects its previous period disequilibrium at a speed of 51.34% within one period of time. The t-statistic is -6.502945 and the coefficient is statistically significant with $0.0001 < 0.05$.

Table 5: Result of cointegration and long run adjustment

Variable	Coefficient	Std. Error	t-statistic	Prob.
D(logRREM)	0.384315	0.060929	6.307573	0.0001
D(logRTE)	-0.014568	0.023106	-0.630491	0.5425
D(logRTE(-1))	0.239758	0.051973	4.613151	0.0000
D(logRFA)	0.030494	0.038212	0.798020	0.4434
CointEq(-1)*	-0.513476	0.078961	-6.502945	0.0001

3.6 Residual Diagnostics

Based on the Jarque-Bera the residuals of the test are normal. The value is 0.718172 and p value is 0.698314 which is greater than the 0.05 and it is proved that the data is normally distributed.

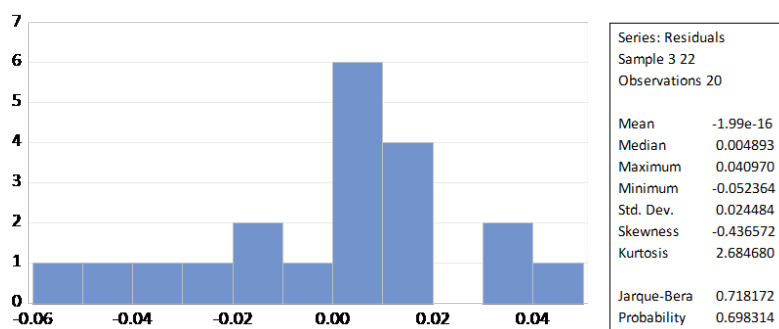


Figure 1: Result of Jarque - Bera Residual test

3.7 Breusch – Godfrey Serial Correlation LM Test

Since the probability value of Chi-square is 0.6010 in the table 6, the null hypothesis can't be rejected. It means that the residual obtained from the ARDL model is free from serial correlation.

Table 6: Result of Breusch - Godfrey Serial Correlation LM test

F –statistic	0.214564	Prob. F(2,8)	0.8114
Obs* R-squared	1.018202	Prob. Chi- Square(2)	0.6010

3.8 Breusch-Pagan-Godfrey heteroscedasticity Test

Table 7 indicates the results of heteroscedasticity and serial correlation. The Breusch Pagan-Godfrey test was applied to examine the problem of heteroscedasticity in the residuals. The examined results of heteroscedasticity indicates that no problem of heteroscedasticity exists in our data based on the calculated P-value which is higher than the 0.05.

Table 7: Result of Breusch-Pagan-Godfrey heteroscedasticity test

F- statistic	0.546937	Prob.F (9,10)	0.8111
Obs* R-squared	6.597363	Prob. Chi-Square(9)	0.6790
Scaled explained SS	1.389306	Prob. Chi-Square(9)	0.9979

3.9 Ramsey RESET Test

This test was used to check the appropriate functional form. The probability value of F statistics is 0.0768 suggesting that the model is well specified i.e. model has no any omitted variables.

Table 8: Result of Ramsey RESET test

	Value	df	Probability
t-statistic	1.997637	9	0.0768
F statistic	3.990555	(1,9)	0.0768

3.10 Stability Diagnostics

The plots of CUSUM and CUSUM of squares remained between the 5% critical bounds which prove the stability of the parameters. The model is structurally stable. But, if CUSUM and CUSUMQ exceed the 5% critical bounds we can confirm instability of the coefficient.

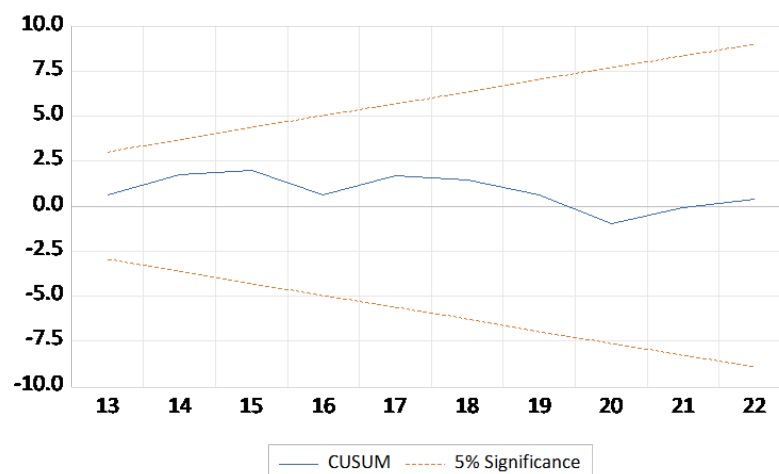


Figure 2: Result of CUSUM Test

Figure 2 and figure 3 indicate the graphs of CUSUM and CUSUMQ. CUSUM and CUSUMQ were applied to examine the stability of the coefficient. Brown et. Al (1975) revealed that graph of CUSUM and CUSUMQ are applied to examine the stability of coefficients of the long run and the short run ARDL. The CUSUM and CUSUMQ graph above indicated that the coefficients of the long run are stable because the blue line is under the red lines.

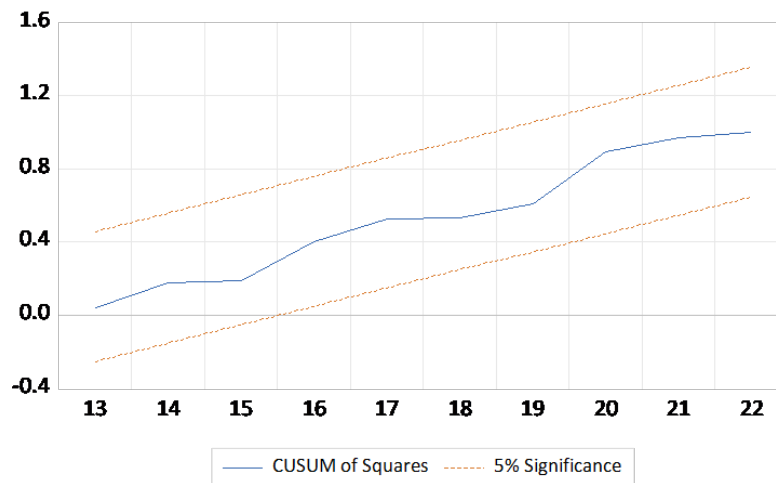


Figure 3: Result of CUSUMQ test

4 Discussion

The main aim of the paper was to investigate the relationship between remittance inflows and the import volume of Nepal using comprehensive time series data from 2000/01 to 2021/22. To gauge this relationship, the ARDL model was employed. The lagged import variable exhibited a significant and positive effect on current imports of Nepal, with the coefficient indicating that a 1% increase in the rate of lagged imports boosted current imports by 0.60% in one year, suggesting a strong dependency on previous imports. Remittances were found to have a positive and statistically significant effect on imports, where a 1% increase in real remittances boosted current imports by 0.17% in one year. This supports the hypothesis that remittances increase purchasing power within the economy, leading to higher demand for imported goods, consistent with studies like Barua et al. (2017), which found that remittances boost consumption and, consequently, imports in developing economies. Both current tourist earnings and foreign assistance did not show significant impacts on imports. However, lagged foreign aid had a positive but insignificant effect, consistent with Meyer and Shera's (2017) findings that the impact of foreign aid is often delayed and diffused. Conversely, this finding diverges from Katircioglu (2009), which had observed that tourism revenue significantly boosts imports due to increased foreign exchange availability. This discrepancy might be due to differing economic structures and level of tourism dependency. The study revealed a mixed impact of exports on imports. Current exports positively influenced imports, while lagged exports had a negative effect, which could be interpreted through the lens of the J-curve effect, where currency depreciation initially worsens the trade balance (increasing imports) before improving it (reducing imports) as exports eventually rise. These mixed effects of exports on imports are similar with the findings of Arize et al. (2000), who noted that export and import relationships are complex and can vary based on factors like exchange rate policies and economic cycles. Various diagnostic tests, including the Breusch-Godfrey Serial Correlation LM Test and the Breusch-Pagan-Godfrey Heteroscedasticity Test, confirmed the robustness and reliability of the model. The stability diagnostics further supported the stability of the estimated coefficients, ensuring the validity of the findings over the study period.

5 Conclusion

The research paper successfully employed the ARDL model to investigate the relationship between remittance inflows and import volume in Nepal. The main findings include a significant positive impact of lagged imports on current imports, suggesting a strong dependency on past import levels. There is also a positive and statistically significant effect of remittances on imports, indicating that remittances increase the economy's purchasing power, thereby elevating the demand for imported goods. The study found the current tourist earnings and foreign assistance to be insignificant in affecting imports, although lagged foreign aid has a positive but insignificant effect, aligning with findings that the impact of foreign aid can be delayed and diffused. Additionally, there is a mixed impact of exports on imports, where current exports positively affect imports while lagged exports have

a negative effect, which can be explained by the J-curve effect, where initial currency depreciation worsens the trade balance before improving it. Finally, various diagnostic tests confirmed the robustness and reliability of the model, ensuring the stability and validity of the estimated coefficients over the study period. For extensive study, the further study should be done, including FDI, real exchange rate and other relevant variables to improve the model presented here.

Conflict of Interest:

The author declares that there is no conflict of interest.

References

- Adams Jr, R. H. (2011). Evaluating the economic impact of international remittances on developing countries using household surveys: A literature review. *Journal of Development Studies*, 47(6), 809-828.
- Adhikari, R., Jampaklay, A., & Chamrathirong, A. (2011). Impact of children's migration on health and health care-seeking behaviour of elderly left behind. *BMC Public Health* 11(1), 1-8.
- Arize, A. C., Osang, T., & Slottje, D. J. (2000). Exchange-rate volatility and foreign trade: evidence from thirteen LDC's. *Journal of Business & Economic Statistics*, 18(1), 10-17.
- Asteriou, D., & Hall, S. G. (2007). *Applied Econometrics: a modern approach*, revised edition. Hampshire: Palgrave Macmillan, 46(2), 117-155.
- Barua, S., & Rafiq, F. (2020). Macroeconomic determinants of remittances and implications for economic growth: Evidence from Bangladesh. *Bangladesh's Macroeconomic Policy: Trends, Determinants and Impact*, 371-392.
- Bhandari, P., & Chaudhary, I. (2017). A calendar method of collecting remittance use data in a remittance dependent setting of Nepal. *Migration and Development*, 6(2), 177-197.
- Dhungel, K. R. (2018). The link between remittance and economic growth: An ARDL Bound Testing Approach. *NRB Economic Review*, 30(2), 1-18.
- Farzanegan, M., & Hassan, S. (2016). Remittances and trade balance: Evidence from the Middle East and North Africa.
- Kaphle, R. R. (2018). Relationship between remittance and economic growth in Nepal. *Tribhuvan University Journal*, 32(2), 249-266.
- Kandil, M. (1999). Evidence from Egypt. *Area Studies and Social Science: Strategies for Understanding Middle East Politics*, 81.
- Katircioglu, S. T. (2009). Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration. *Tourism Management*, 30(1), 17-20.
- Klugman, J., & Medhalho Pereira, I. (2009). Assessment of National Migration Policies: An emerging picture on admissions, treatment and enforcement in developing and developed countries. *United Nations Human Development Research Paper*, (48).
- Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth: An econometric model. *EconomiA*, 18(2), 147-155.
- Ministry of Labour and Employment. (2016). Labour migration for employment: A Status Report for Nepal 2014/15. Author.
- Muktadir-Al-Mukit, D., Shafiullah, A. Z. M., & Sajib, A. H. (2013). Determination of causality between remittance and import: evidence from Bangladesh. *International Journal of Business and Social Research (IJBSR)*, 3(3), 55-62.

- Olubiyi, E. A. (2014). Trade, remittances and economic growth in Nigeria: Any causal relationship? *African Development Review*, 26(2), 274-285.
- O'Toole, J. (1980). Work in an era of slow economic growth. *Technological Forecasting and Social Change*, 16(4), 277-310.
- Pant, D. (2017). An analysis of the determinants of remittances and effect of remittance on expenditure behaviour and child welfare in the households of Nepal (Doctoral Dissertation, University of Reading).
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American statistical Association*, 94(446), 621-634.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.
- Portugal, A., & Zildzovic, E. (2016). From Evidence to Policy Supporting Nepal's Trade Integration Strategy: Trade Imbalances and Remittances. World Bank.
- Sah, B. N. (2019). Remittance and economic development of Nepal. *Patan Pragya*, 5(1), 196-208.
- Tachibana, T., Goto, R., Sakurai, T., Rayamajhi, S., Adhikari, A., & William H. D. (2019). Do remittances alleviate negative impacts of disaster on mental health? A case of the 2015 Nepal earthquake. *Social Science and Medicine* 238(1), 1-10.
- Vacaflares, D. E. (2018). Are remittances helping lower poverty and inequality levels in Latin America?. *The Quarterly Review of Economics and Finance*, 68, 254- 265.
- World Bank (2018). World development report 2018: Learning to realize education's promise. The World Bank.
- World Bank (2019). Global Economic Prospects, January 2019: Darkening Skies. The World Bank.
- World Trade Organization (2021). World Trade Report. Economic Resilience and Trade.
- World Trade Organization (2022). World Trade Report.
- Zaman, K. U. Imrani, NA, (2005). "Workers' remittances and import demand in Pakistan". *The Philippine Review of Economics*, 42(2), 27-137.

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