Impact of Remittances on Trade Deficit in Developing Countries: The Case of Nepal

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Abstract

The paper examines the impact of remittances on trade deficits of Nepal, one of the major concerns of the policymakers and stakeholders at the current time. Using the annual data for the period of about two and a half-decade that is from 1996 to 2019. For this purpose, this paper employs the autoregressive distributed lag (ARDL) approach to co-integration considering the time-series properties of the data. The results show that remittances have a strong positive association with trade deficits. Our findings indicate that remittances have contributed to trade deficits both in the long and short run. It suggests a symptomatic presence of 'Dutch Disease' leading to erosion in competiveness and widening trade deficits. One way to reduce the ever widening trade deficit is to create conducive environment to channel the remittance on capital investment that supports the domestic production capacity. This may in turn help on import substitution and promote the exports.

Keywords: *Remittances, Trade balance, ARDL Model.*
JEL codes: C23, O16, O40.

Introduction

Developing countries' dependency on remittances to run even the current expenditure has got neumerous attention in the literature. For example, Ebeke (2012), using a sample of 86 developing countries cases, discusses this issue indicating a kind of moral hazard in the absence of governnance quality and managerial efficiency. Nepal is also developing country receiving a significant amount of remittances over the past two decades and the stakeholders are concerned seriously whether the remittances have fuled the trade deficit in the country.

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Since the restoration of the democracy in 1989/90, the number of outmigrant Nepalese workers has increased gradually following the trend of many developing countries, which have been able to attract a significant amount of remittances in the recent decades. These inflows in Nepal have increased substantially from 2001 onward, and it has reached around 30 percent of the country's GDP in 2017, and now accounts at nearly 20 percent of GDP (NRB, 2020). Because of this scenario, remittances have become an increasingly interesting scope of research for many researchers and economists. Many research works have found a positive impact in enhancing economic growth and uplifting the living standard of people in different countries' perspectives (Hasan, Akhter, & Saha, 2019). Yet, the channel of the contribution of remittance to economic growth is a topic of interest. Normally, channels are notable from which remittance can contribute to the economy. First, increasing consumption via which the quality of human resources of the country improves so that a substantial contribution to the economy is possible. Second, if the remittances are utilised properly and linked with entrepreneurship, it helps to increase economic activities and export trade, from which the employment generation and other positive efforts become useful to increase the national output. But in the Nepalese context, the trade deficits have been a long-term phenomenon in the national economy now.

A long time back, Sapkota (2013) stated that remittances have caused a kind of 'Dutch Disease' in the country. In the same year, Bhatta (2013) documented that remittances have a strong long-run relationship with the trade deficit. It seems that the scenario is getting worse in recent years as both of these variables (remittance and trade deficit) are increasing substantially since then. As of now, the trade deficit is almost 28 percent of Nepal's gross domestic products (GDP), which was about 21 percent in 2010/11 (NRB, 2020).

Paudel et al., (2020) showed that remittances have a strong negative impact on export performance. This means that remittances are fueling import promotion and export distortion, which may be the reason for the trade deficit, which is a serious concern of the policy makers and other stakeholders in the country. Therefore, a thorough investigation of the impact of remittances on the trade deficit will help to form relevant policies for the proper utilization of the remittances.

The main concern in this paper is the macro economic impact of remittances on the trade deficit. A huge flow of remittance scan lead to the appreciation of a country's exchange rate andhurtits competitivenesson one hand,and on the other hand, it will boost the imports, which is an adverse economic phenomenon known as the 'Dutch Disease'. Even, the financial development has hurt the export performance that led to the trade trade deficits. Against this crucial background of the remittances, the inflows into Nepal has reached to more than 25 percent of country's GDP in the years 2013 to 2016 and has remained around 25 percent in the recent years (World Bank, 2020), while the trade deficits have recorded the apex numbers in the last five years (NRB, 2020).

This study econometrically investigates using annual data from Nepal for the period

of 26 years, that is, from 1993-2019 employing time series technique. To select the period, we tried to capture the longest possible time series excluding outlier year 2020. The major finding of this paper is that remittances have a positive impact in the trade deficits of Nepal in both the long and short run. In this regard, we should be aware that the remittances may have positive impact in economic activities from other channel like imports, foreign currencies' role in the economy, money circulation, and government revenues, and so on while designing remittance specific policy.

The following section of this paper presents a brief trends of trade deficits and remittances in Section 1 and Section 2 following a brief literature review in Section 3. Section 4 provides a framework for the empirical study focusing on research methodology. Section 5 discusses the results from the empirical study, and the final section concludes.

Trend of Remittances and Trade Deficit

If we have a look at the trends of remittances and trade deficit, both seem increasing over the selected period, that is the year 1993 to 2019. Figure 1 presents trend of these two variables and both are measured as the percent of gross domestic product (GDP). The trade deficit expressed as a percent of GDP shows more osscilations compared to remittances as the percent of GDP, which has a sharper incline in the years (Figure 1). The trade deficit has a sharp incline in the mid-1990s and then had a gradual decline up to the first half decade of the millenium, and then recorded the highest, that is 34.2 percent, in the year 2018.

In the case of remittance, as noticed in the figure, it has a sharp incline since the year 2001 from around two percent to 11 percent in one year period. The political turmoil seems played a significant role to happen such scenario of youth flights from the country. Since then, there are very few fluctuation but with the high growth of remittance to reach about 28 percent in the year 2015.

Figure 1: Trends of Remittances and Trade Deficit (1993-2019)
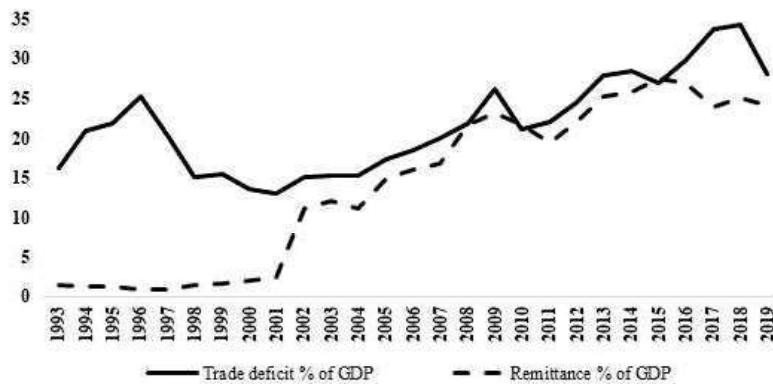
Source: World Bank (2020)for remittance and NRB (2020) for Trade deficit.

Review of Literature

There are many studies focused on different dimensions of remittances. These literatures suggest two important points in the association of remittances and international trade based on different methodologies, countries cases and qualitative analysis. One string of literature suggest it boosts imports and results trade deficits. Another string of literature shows the negative association of remittances and export performance linking the literature with the 'Dutch Disease' story as found by Sapkota (2013) in the context of Nepal.

Remittances and Poor Export Performance

Kandil and Mirzaie (2008) found a contradictory result on the role of remittances on export performance. For example, a positive contribution of remittances in export growth in the case of Tunisia but a negative impact in other countries, such as, Jordan and Egypt. Another study by Bayangos and Jansen (2011) examined the impact of remittance on the export competitiveness and performance using the data from Philippines and found a negative impact in the export performance.

In a study, in the context of Bangladesh, Chowdhury and Rabbi (2014) analysed the impact of workers' remittances suggested that the remittances inflows caused to lose the export competitiveness in line with the story of 'Dutch Disease'.

Shamim et al., (2015) found a negative effect of remittances on export performance in the long run-in case of Pakistan. Recently, Jena and Sethi (2019), using the annual data for South Asian countries for the period of 1993-2017, suggested that remittances inflows are affecting export performance negatively during the study period in the region. Most recently, Hien, Vinh, and Mai (2020) found a support for 'Dutch Disease' story for a panel of 32 countries covering the period of 2006 to 2016. The main reason is that it hurts exports making uncompetitive.

Remittances, Trade Balance, and Import Boost

Some research works have shown the positive impact of remittances on economic growth, largely via imports and foreign currency earnings. But the net effect is boostings of the imports. Bugamelli and Paterno (2011) suggested that remittances help to increase the stock of foreign reserves and can be away of surplus balance of payment account using the panel data of 60 developing countries.

Okodua and Olayiwola (2013) studied the remittances impact on trade balance using the panel data from Sub-Saharan Africa and found that remittance have negative impact on trade balances (increases trade deficits) but the results are not statistically significant. Bhatta (2013) stated that remittances have a strong long-run relationship with the trade deficit, boosting imports and detering exports. This study employed vector error correction model (VECM) using Nepal's monthly data for the period of August, 2001 to May 2011.

Ahmed, Vishnu, & Ahmad (2014) stated that remittances increase purchasing power within the receiving economy, which promote domestic demand and preference may actually be infavour of imported goods and services based on those amount of remittances. This situation of trend results in the increament of trade deficit. Similarly, Makun (2018) suggested that government should adopt appropriate policy actions to reduce imports while drawing remittances in the country in the case of Fiji Islands. Minh (2020) found a strong positive impact of remittances on import in the context of Vietnam. Farzanegan and Hassan (2020) found that the remittances inflowhave caused a trade deficits in the Middle Eastern and North African (MENA) regions.

Here, the literature review provides a perception on the role of remittances on trade deficit either we take a note from 'Dutch Disease' story by detering the export performance or bosting imports in the country. Therefore, it can be said that a country cannot progress well to reduce trade deficits until the remittances have the substantial flows. Also, there are many concerns about the growing trade deficits and remittances. A clear research gap is that the role of remittances on rocketing trade deficits in the country for the recent period has not been investigated employing econometric technique. Our approach will be different than that of Bhatta (2013) in three aspects: First the data coverage will be longer by almost a decade when the various dynamics than in the past have been seen in this nexus; Second, our methodology is different broadly on macroeconomic perspective employing annual data rather than the quarterly data; Third, we look the co-integration order of the variables analysing the time series properties of the data. Therefore, this study has a strong research agenda to justify the need of research explaining the role of remittances in trade deficit of Nepal.

Research Methodology

This paper measures the impact of remittances inflows on trade deficit. In an open economy of the least developed or developing countries, remittances have become one of the major sources of foreign currency earnings, but it has a long run opportunity cost in the economy. One of the such costs is trade deficit. This paper employs a time series econometric analysis to detect the impact of remittances in trade deficits, which is a crucial issue of Nepalese economy at present.

For this, we employ annual data for the period from 1996 to 2019 as some of the crucial variables can go back only up to 1996 and exclude year 2020 as outlier due to Covid-19 pandemic. As the covered period is of 24 years, time series data may have different order of co-integration. Considering this fact, the time series properties are analysed checking the stationarity of the data. Then, we use the data set in the standard model to detect the said impact. We conduct the estimation employing alternative specifications of the model so that the findings are robust.

Model, Variables, and Data

This paper employs an econometric model largely influenced by Okodua and

Olayiwola (2013), Hien (2017); and Farzanegan and Hassan (2020). Here, the main concern is whether remittances have fueled to trade balance and if yes what is the elasticity for such impact. For this purpose, a benchmark model is developed as in the equation (1).

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_2 FAID_t + \beta_3 GDPPCG_t + \beta_4 INFL_t + \epsilon_t \ldots \ldots (1)$$

where, TDEF (trade deficit) is dependent variable, which is measrured as percent of GDP (gross domestic produt), REM (remittances) is the main variable of interest of this paper and this is also measured as percent of GDP. The another controlled variable is FAID (foreign aid), which is also mearued as the percent of GDP. Similarly, GDPPCG (per capita GDP growth) and INFL (inflation) are other controlled variables. Here, both of these variables are measured in their annual growth rate percent. The first variable of the right hand side (is constant, are coefficients of the independent variables to show the elasticities, t is year, and the last term is the error term.

Based on the literature, we expect to be both positive or negative. In case of positive, we mean that remittances have casued to import more leading to trade deficit and vice versa. The coefficient for is expected to be negative as the foreign aid could help building infrastruture and promoting exports based on the literature of aid for trade (Stiglitz & Charlton, 2006). The variable is used as the proxy of infrastructure quality and capital stock that would contribute to improve the trade balance motivating the export factors. Therefore, we expect to be negative. The inflation cause to decline the purchasing capacity of the consumer so that lowers the import and hence reduces the trade deficits. It supports for the coefficient of to be negative.

To assure the results are robust, different specifications of the models as mentioned in equations (2) to (6) are tested. Equation (2) is developed replacing GDPPCG variable with REGQTY (regulation quality of the government) to test whether the better regulatory mechanism support to improve the trade balance. Doing this will remove the doubt of the potential biassed from the variable addition and deletion in the results. In this case also, is expected to be negative as the regulatory quality will enhance the exports by improving the doing business envrionment.

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_2 FAID_t + \beta_3 REGQTY_t + \beta_4 INFL_t + \epsilon_t \ldots \ldots \ldots (2)$$

Similarly, equation (3) to (5) are tested reduing the number of variables with alternative specifications.

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_4 INFL_t + \epsilon_t \ldots \ldots \ldots \ldots (3)$$

Again, to check the variable replacment impact, equation (4) is developed.

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_2 FAID_t + \epsilon_t \ldots \ldots \ldots \ldots (4)$$

In equation (5), another variable for governance, GOVEFNS (governance effectiveness) is replaced and regressed with the main variable of interest. This is slightly

different than the REGQTY but expected same direction of impact on trade deficits.

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_3 GOVEFNS_t + \epsilon_t \dots\dots\dots\dots (5)$$

Finally, in equaion (6), REGQTY is regressed along wih the main variable of interest, and expect the negative coefficient as explain earlier.

$$TDEF_t = \beta_0 + \beta_1 REM_t + \beta_3 REGQTY_t + \epsilon_t \dots\dots\dots\dots\dots (6)$$

The REGQTY and GOVEFNS data are mesured in index points.

Data Sources

The data used in this empirical analysis are collected from the world development indicators as given in World Bank (2020) except for trade deficits percent of GDP which are collected from Nepal Rastra Bank (2020).

Unit Root Tests

The next step is to conduct the unit root tests to confirm whether each series is integrated and has a unit root using Dickey-Fuller test (DF), Augmented Dickey-Fuller (ADF) test, and the Phillips and Perron (P-P). These tests are performed to know the time-series properties of the data and employ three methods to make sure the tests are more trustable. Test results are achieved assuming the presence of a unit root (non-stationary variable) in the null hypothesis (H_0) and no unit root (stationary variable) in the alternative hypothesis (H_1).

In this process, a decision is made based on the calculated statistic and McKinnon's critical value; that is, if the calculated statistic is higher than McKinnon's critical value, then H_0 is not rejected, and considered the variable is non-stationary (has a unit root). To make the test systematic and reliable, we observed in level and then in first differences, including the intercept and time trend, because this is the most flexible specification of the test, as illustrated in equation (7).

$$\Delta Z_t = \alpha_1 + \alpha_{2t} + \gamma Z_{t-1} + \sum_{j=1}^{k} \beta_j \Delta Z_{t-j} + \varepsilon_t \dots\dots\dots\dots\dots\dots (7)$$

Where, Δ is the first difference operator, Z is the variable of interest, is the intercept, t is the period, ΔZ the augmented terms, k is the appropriate lag length of the augmented terms and ε is the white noise error term, β is the coefficient of the variable of interest in j^{th} lag. The ADF test is essentially the test of significance of the coefficient in the above equation. The DF test is performed without the augmented term. To select the lag length k, we start with a maximum lag of 1 considering a relatively small sample of observations and pare it down to the appropriate lag by examining the Schwarz Criterion (SC) following standard procedures.

Table 1 presents the unit root test results of all seven variables for which DF, ADF, and PP tests are conducted with 1 lag selected from the lag selection criteria. The results of the unit root tests show that only the variable GDPPCG is stationary in level form in all method, so it is I(0). The other three variables, such as TDEF, REGQTY and INFL are also considered as the I(0) variables based on their significance at least in two estimated results. The rest of all variables are not I(0), maybe they are I(1) or have a greater order of integration. Therefore, we move further to test for those variables in the first difference. The lower panel of Table 1 presents the test results for such a test of the variables REM, FAID and GOVEFNS, which show all variables are I(1). Thus, we can conclude that the set of variables are mixed with I(0) and I(1).

Table 1: Unit Root Test Results of the Variables

Tests at Level	Test with Constant			Test with Constant & Trend		
Variables	DF	ADF	PP	DF	ADF	PP
TDEF	-0.986	-0.944	-0.944	-2.926	-4.080**	-9.998***
REM	-0.687	-1.320	-1.417	-1.529	-1.199	-1.199
FAID	-0.808	-0.703	-0.915	-1.162	-0.935	-1.035
INFL	-2.739***	-2.701*	-2.700*	-2.770	-2.667	-2.667
GOVEFNS	-1.225	-1.674	-1.583	-2.988*	-2.901	-2.901
REGQTY	-1.217	-1.517	-1.428	-3.602**	-3.707**	-2.030
GDPPCG	-4.223***	-4.27***	-4.226***	-4.713***	-4.298**	-4.982***
Critical value @ 5%	**-1.950**	**-2.943**	**-2.943**	**-3.190**	**-3.536**	**-3.537**
Tests at first difference	Test with Constant			Test with Constant & Trend		
Variables	DF	ADF	PP	DF	ADF	PP
REM	-4.336***	-4.338***	-4.335***	-4.393***	-4.325***	-5.682***
FAID	-4.600***	-4.639***	-4.643***	-4.967***	-4.928***	-4.956***
GOVEFNS	-5.010***	-5.376***	-6.347***	-5.438***	-5.201***	-6.098***
Critical value @ 5%	**-1.95**	**-2.94**	**-2.94**	**-3.19**	**-3.548**	**-3.540**

Source: Authors' calculation.

Note: *, ** and *** indicate the values are significant at 10%, 5% and 1% level of significance.

Choice of ARDL Model

Once the time series properties are analysed for the model and all variables, then we move to co-integration tests. As we have the time series data with the different order of integration, that is, the set of I(0) and I(1) variables in the model, we conduct the empirical tests using the autoregressive distributed lag (ARDL) approach of co-integration. The ARDL method is best suited because of two reasons: first, we have a mixed set of the co-integration vector of the variables, that is, I(0) and I(1) and the approach provides the best results in such context. Second, this method provides the coefficients for both long-run and short-run so that we can estimate the results on the impact of remittances and other variables on trade deficit detecting how is the direction in the long-run and short-run as discussed in many literatures (Pesaran, et al. 2001; Paudel & Jayanthakumaran, 2009). For this purpose, the benchmark model as stated in equation (1) will be modified as in equation (8) to represent the ARDL version of the specification.

$$\Delta TDEF_t = \alpha + \beta_1 TDEF_{t-1} + \beta_2 REM_{t-1} + \beta_3 FAID_{t-1} + \beta_4 LGDPPC_{t-1} + \beta_5 INFL_{t-1}$$
$$+ \sum_{i=1}^{24} \gamma_i \Delta TDEF_{t-i} + \sum_{i=1}^{24} \delta_i \Delta REM_{t-i} + \sum_{i=1}^{24} \theta_i \Delta FAID_{t-i}$$
$$+ \sum_{i=1}^{24} \varphi_i \Delta GDPPCG_{t-i} + \sum_{i=1}^{24} \lambda_i \Delta INFL_{t-i} + v_t \dots\dots\dots\dots\dots (8)$$

Here, the equation (8) captures the dynamic impact in the form of Auto-Regressive Distributed Lag Model, in which,stands for the first-order differential variable, are the coefficients of first-order variables. Similarly, are the parameters of the error correction model, and the final term is the vector of random error terms.

Results and Discussion

Table 2 presents the bound test results based on F-statistics value of all equations of the alternative specifications of the model, such as equations 1 to 6 respectively. As seen in the Table 2, if the F-statistics are higher than the upper bound critical values, we conclude there exists a long run relationship in the model. If the F-statistics are lower than the lower bound of the critical values we conclude that no long run relationship exists in the model, and if the F-statistics are in between lower and upper bound of the critical values, we conclude the results are ambiguous, meaning that the long run relationship may or may not exist in the model. For this purpose, we consider the critical value range at 90 percent level of confidence (10 percent level of significance). Based on the results, for model (1) and (2) the F-statistics belong in between the lower and upper bound of critical values indicating that the results are inconclusive at this stage, while F-statistics are above the upper bound of the critical values for models (3), (4), (5) and (6) and we concluded that there exist the long run relationships in the respective models.

Table 2: Bound Tests Results

Details	(1)	(2)	(3)	(4)	(5)	(6)
F-tests Statistics	3.61	4.13	5.40	6.84	5.39	5.47
Critical Values: Upper Bound	4.20	4.20	4.65	4.65	4.65	4.65
Lower Bound	2.91	2.91	3.57	3.57	3.57	3.57
Decisions	Amb.	Amb.	LR	LR	LR	LR

Source: Authors' calculation.
Note: Critical values are considered based on at least 10 percent level of significance. Amb. refers the results are ambiguous and need further investigation, LR refers the long run exists in the respective specification of the model.

In the next step, we conduct the co-integration test to find the long run coefficients. Table 3 presents the long-run relationship results for the model of different specifications in columns (1) to (6) for each equation from (1) to (6) respectively. Similarly, Table 4 presents the results for the ECM (Error Correction Model) version in different specifications.

These tables show the long-run and short-run coefficients of ARDL with different lags as shown in their bottom row for the given model. Schwartz-Bayesian Criteria (SBC) is selected due to the relatively small size of the series.

The results in the column (1) of Table 3 show that the remittances (REM) have a strong impact in trade deficits in Nepal. Overall, the coefficients of Remittance-GDP ratio are robust to the alternative specifications of the estimating equations. The results suggest that a one percent increase in remittance causes to increase trade deficit on average by 0.65 percent holding other variables in the model constant. This result reflects Figure 1, where remittances and trade deficits both have moved upward together maintain almost a similar trend. Further, foreign aid (FAID), per capita GDP growth (GDPPCG), and inflation (INFL) variables are included in the estimations and results are presented in the same column. The results for the rest of the variables in the model are not statistically significant but they have clearly indicated the direction of the association with the trade deficits. For example, FAID has a negative association with trade deficits and the coefficient is notably high. The amount received from foreign aid has contributed to the quality infrastructure to contribute to the national output and export by that trade deficits can be reduced. The impact of GDPPCG and inflation have positive impact on trade deficit. The results of these two variables also seem realistic the country has a growing trend of consuming imported products as the per capita income increases. On the other hand, inflation also has caused to increase trade deficit as we note that the inflation causes to increase the prices of imported commodities that also leads to increase the import value with the trade deficits.

We include some another variable-regulatory quality (REGQTY) and exclude GDPCCG to check whether the results have the biases of variable addition and deletion

from the model, and the results are presented in column (2) of the same table. Here, the results for REM are not meaningfully different than that of column (1). The result for FAID has same direction. When REGQTY is included the coefficient for INFL has turned to be negative, however, statistically not significant on this occasion too. The coefficient for REGQTY is negative as expected but again it is not significant statistically indicating that improved regulation quality of the government would enhance export or domestic production and reduce trade deficit, but it has not been developed enough to show such a significant impact on reducing trade deficit.

In columns (3) to (6) of the Table 3, we have presented the results for the regression using REM and another one variable in each column. These results not meaningfully different than the results of the earlier columns indicating the results for REM, which is the main variable of interest in this paper, are robust.

Remittances can contribute to reduce trade deficit and to improve the trade balance, if the substantial portion of remittances are used to import capital and technology products that can contribute to increase national output and exports as discussed in Saadi (2020), the condition is that only if the significant proportion of available funds from remittances are used for investment purpose or to increase the productivity of the production forces.

The results in all columns have an almost similar explanation while focusing on the coefficients of REM. However, the magnitudes of the coefficients as stated in different columns are slightly different, but the direction of the association remain consistent. These results have provided enough based to conclude that a one percent increase in the remittance inflows cause to increase the trade deficit on average by at least 0.60 percent holding the other variables in the model constant.

Table 4 presents the short-run results of the model. In all six specifications, ECM (-1) results are statistically significant with the expected negative sign indicating the disequilibrium that occurred in the previous year is corrected in the current year following a short-run shock at a relatively moderate pace as the coefficients are greater than - 0.30 and smaller than - 0.60 in absolute term. The remittances have significant impact on trade deficit with positive association in the short run too. We did not find such impact from other rest of the variables on trade deficit.

Considering the post estimation tests statistics, we say that the R-square shows that the overall goodness of fit of the model and is high but within the acceptable range of 0.90. The diagnostic test results show that the model passes the tests for serial correlation, functional form, normality, and heteroscedasticity. Further, the stability test results (CUSUM and CUSUMSQ) plotted against the critical bounds of 5 percent level of significance are within the range, indicating that the model is structurally stable (Figures 2 to 7). The stability tests show the estimated results lie within the boundary of a 5 percent level of significance (95 percent level of confidence). These results indicate no evidence of misspecification and instability during the period covered for the estimation in the econometric modelling process of this paper.

Table 3: Long Run Relationship Coefficients (Dependent Variable: TDEF)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
REM	0.64*** (0.121)	0.60** (0.251)	0.84*** (0.165)	0.71*** (0.122)	1.03*** (0.341)	0.60** (0.270)
FAID	-2.08 (1.49)	-1.21 (2.082)		-2.13 (1.512)		
GDPPCG	0.65 (0.417)					
INFL	0.20 (0.403)	-0.39 (0.510)	-0.61 (0.461)			
REGQTY		-11.58 (13.865)				-11.43 (15.62)
GOVEFNS					12.82 (14.154)	
Selected lags	*(1,0,0,0,1)*	*(1,0,0,0,0)*	*(1,0,0)*	*(1,0,0)*	*(1,0,0)*	*(1,0,0)*
No. of Observations	*24*	*24*	*24*	*24*	*24*	*24*
R-squared	*0.89*	*0.91*	*0.90*	*0.89*	*0.90*	*0.90*

Source: Authors' calculation.

Note: ***, ** and * indicate that the statistics are significant at 1%, 5%, and 10% level of significance. The figures in the parenthesis are the standard error.

Table 4: ECM Results [Dependent Variable: TDEF(-1)]

Variables	(1)	(2)	(3)	(4)	(5)	(6)
REM (-1)	0.37*** (0.077)	0.28** (0.107)	0.32*** (0.066)	0.34*** (0.075)	0.38*** (0.101)	0.24** (0.102)
FAID (-1)	-1.22 (1.091)	-0.56 (1.078)		-1.02 (0.872)		
GDPPCG (-1)	0.38 (0.284)					
INFL (-1)	-0.21 (0.205)	-0.18 (0.205)	-0.23 (0.164)			
REGQTY (-1)		-5.33 (6.644)				-4.67 (6.662)
GOVEFNS (-1)					4.66 (4.711)	
ECM (-1)	-0.59*** (0.164)	-0.46*** (0.147)	-0.38*** (0.094)	-0.48*** (0.126)	-0.36*** (0.099)	-0.41*** (0.103)
Selected lags	*(1,0,0,0,1)*	*(1,0,0,0,0)*	*(1,0,0)*	*(1,0,0)*	*(1,0,0)*	*(1,0,0)*

Source: Authors' calculation.

Note: ***, ** and * indicate that the statistics are significant at 1%, 5%, and 10% level of significance. The figures in the parenthesis are the standard error.

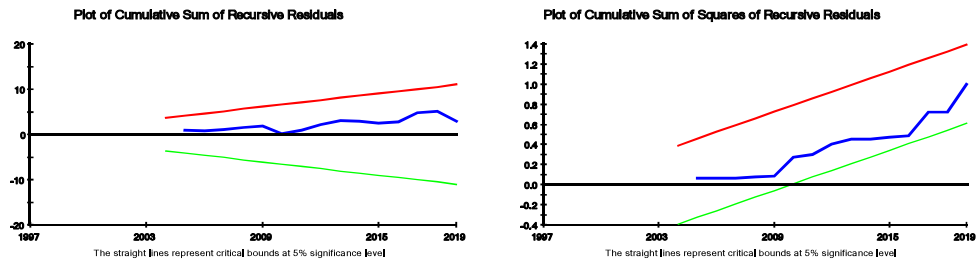## Figure 2: Plot of CUSUM and CUSUM Squared Figure for (1)

Figure 3: Plot of CUSUM and CUSUM Squared Figure for (2)
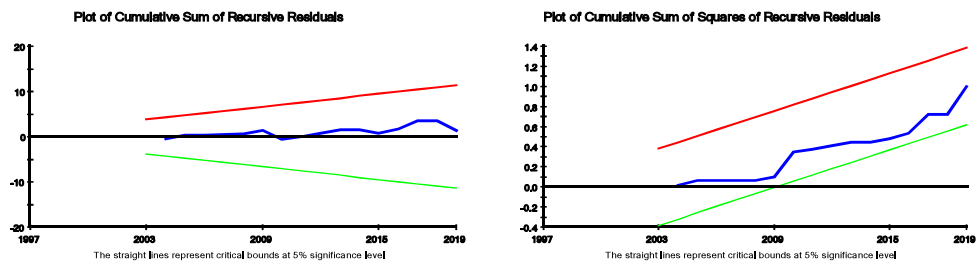

Figure 4: Plot of CUSUM and CUSUM Squared Figure for (3)
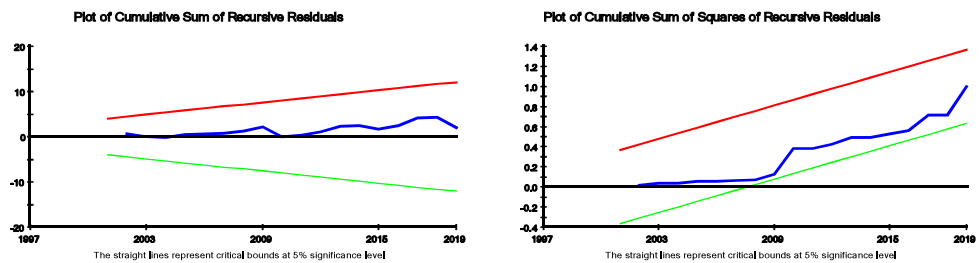

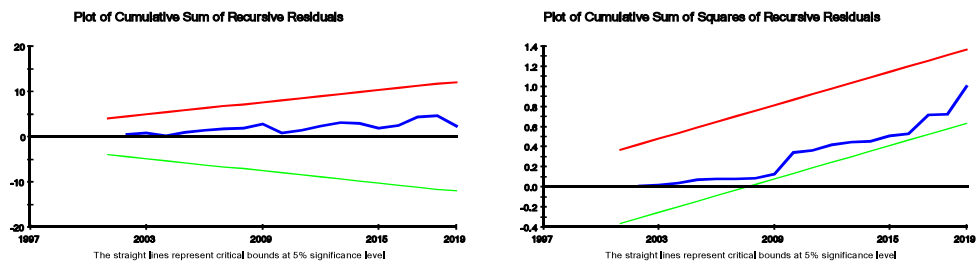## Figure 5: Plot of CUSUM and CUSUM Squared Figure for (4)

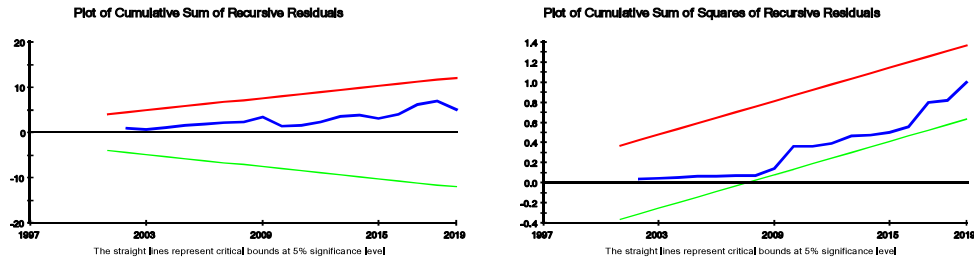**Figure 6: Plot of CUSUM and CUSUM Squared Figure for (5)**

Plot of Cumulative Sum of Recursive Residuals
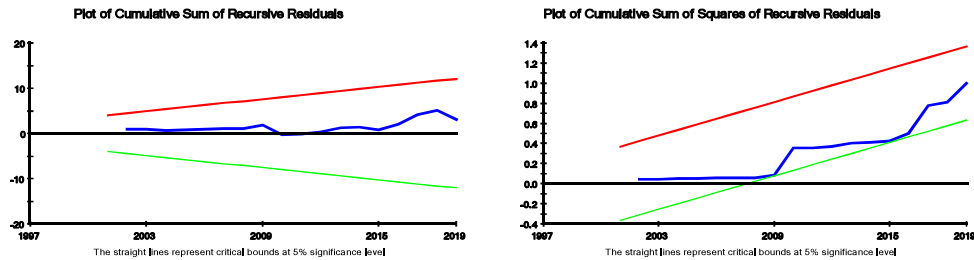
Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Figure 7: Plot of CUSUM and CUSUM Squared Figure for (6)

Plot of Cumulative Sum of Recursive Residuals

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Conclusions

Given the major findings in this study which clearly highlight the strong positive association of the remittances on trade deficit in the long run and regulatory mechanism seems helpful if it is developed to the set standard further. Therefore, there are two major policy issues arise from the empirical findings in this study.

First, an increase in the remittances inflow to Nepal is observed to increase the trade deficits in the long run. Therefore, the appropriate policy may be not to limit the remittance flows, but to learn to enhance export with them developing compulsory saving and investment provisions. Indeed, appropriate policies are needed to ensure that these financial flows are properly channelled into economically productive uses to begin to contribute positively to the external sector of the economies. Enabling investment climate and improving doing business indexes may be more effective in encouraging remittances to flow into productive business scopes.

Second, the negative signs of FAID and REGQTY variables in explaining the trade deficits indicate possible ways to reducing trade deficits in Nepal. Increase in these variables (improving foreign aid inflows and governments regulatory quality) indicatethe possible ways to control current status of trade deficits in the country. Doing this is in line with theoretical expectation that foreign resources are utilized more seriously and productivly than the owresources having better regulation quality in the country. However, the sepolicies have to be very carefully decided and developed considering their impacts on other sectors and societies in the country.

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