

# Role of Workers' Remittances in Export Performance of Nepal: Gravity Modelling Approach

Ramesh C. Paudel\*  
and  
Tara Prasad Bhusal\*\*

---

## Abstract

*Role of workers' remittance seems to be an imperative part of Nepalese economy for about two decades. The remittances inflow has supported to maintain the foreign reserves at the national level and consumption in household level. This paper investigates the role of remittances in export performance of Nepal employing the gravity modelling approach using annual data for the period of 26 years, from year 1993 to 2018. First, we document the scenario of remittances and export nexus, then conduct an econometric estimation for the exports flows from Nepal to its trading partners. The major finding indicates that the remittances have a statistically significant negative impact on export performance, which is largely impacted by the size of the trading partner's economy as indicated by the estimation's results. The study suggests for an urgent attention from policy makers to make the remittance in favor of exports by developing the export strategies. In this regard, a special focus on exporting to the rich economies may be a good way to boost the export performance of Nepal.*

---

**Key Words:** Export performance, remittances, gravity modelling approach

**JEL Classification:** F130, O53, and Q43

---

\* Corresponding author, Associate Professor, Central Department of Economics, Tribhuvan University, Kirtipur, Kathmandu, Nepal. Email: ramesh.paudel@alumni.anu.edu.au

\*\* Professor, Central Department of Economics, Tribhuvan University, Kirtipur, Kathmandu, Nepal.

## I. INTRODUCTION

Workers' remittance has been a common phenomenon of Nepalese economy for almost two decades now. The data shows that the volume of remittances inflows is about 30 percent of Nepal's gross domestic products (GDP), on average, with some fluctuations. Notably, the inflows of remittances have increased since 2002 and it has become an indispensable part of national economy. Imports seem to have surged since around the same time indicating the imports have been fed by remittances. Normally, as the money circulation increases in the households, it is expected that it contributes to increase the entrepreneurship in the society (Galindo and Méndez, 2014). On the other hand, the source of remittance is out migrant youths from the country and it causes to lose the production forces in the national economy, so country starts becoming the importer rather than exporter in the international market.

Nepal's export performance has not met the expectation of the stakeholders, and no doubt neither of policy makers, despite various policy reforms and efforts. In the policy reforms, Nepal adopted the World Trade Organization (WTO) guidelines and notably Nepal is known as one of the earlier entrants in the liberalization and reform era in the South Asian region, but the progress is very slow (Paudel, 2016; Paudel, 2019). Many supporting environments are made. Tariffs are comparatively lower than that of the neighbors', good sized markets in the neighbors, suitable climate and better weather for varieties of entrepreneurships, and cheap labor forces in the countries but all of these have not turned into favorable for exports yet (Paudel, 2007; Paudel and Kankesua, 2009).

This study econometrically investigates a gravity model using annual data of export from Nepal to its partner countries for the period of 26 years, that is, from 1993-2018. For this, we augment the original gravity model suggested in Tinbergen (1962) by adding remittance inflows as a main control variable in the model. Here, we understand the limit of country specific studies such as this one, but we believe that it can provide a benchmark policy guiding for other many countries that pass from similar phase of export trade. Also, we note that knowing the real contribution of the remittance inflows in the export performance of Nepal itself would be a good contribution in policy inferences perspectives.

Our findings from this study suggest that remittances have a negative impact in the export performance of Nepal. In this regard, we should be aware that the remittances may have positive impact in economic activities from other channel, such as, imports, foreign currencies' role in the economy, money circulation, government revenues and so on. Also, the results suggest that exporting to the large economy, rather than to large markets, would help to enhance the export performance of Nepal. The results indicate that a proper coordination between export destination and exportable products may be a good export strategy so that Nepal export's level would be higher. These findings may be of interest for other landlocked developing countries that face the same geographical constraints as of Nepal.

This paper is structured as follows. Nepal's remittances and export patterns are discussed in Section 2, then, we discuss in brief literature about the remittances and exports in Section 3. Then, we discuss research methodology of the paper in Section 4 and move to Section 5 to discuss the results and interpretation before concluding with some policy recommendations in the Nepal's trade context in the final section.

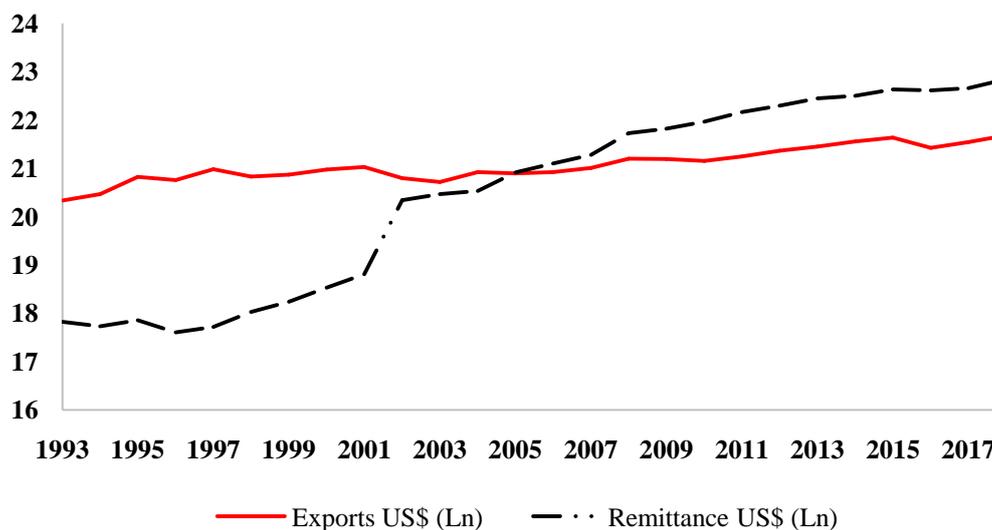
## **II. REMITTANCES AND EXPORT PERFORMANCE**

The role of remittances on export performance is analyzed in this section looking the trends of these variables over the study period. For this purpose, three important data and their relationships are important. First, how remittances and exports are recorded over the period as presented in Figure 1. Second, remittances and exports share in terms of GDP to explore the contribution of these two economic variables in Nepal's GDP as presented in Figure 2. Third, we want to observe Nepal's remittances inflows and exports, while comparing them with the World's respectively, as presented in Table 1.

Figure 1 shows the natural log values of Nepal's exports and remittances inflows both measured in the United States Dollar (USD) for the duration from 1993 to 2018. This figure provides us three important information. First, Nepal's remittances have stronger inclining trend than that of exports. Second, until 2005, Nepal's exports values were higher than that of remittances inflows. Third, even if we look after 2005 period, we see the gap between exports values and remittances inflows is widening in

the recent years. The sharpest incline of the remittances was recorded in between 2001 to 2002, when the political turmoil was in the peak.

**Figure 1: Exports and remittances, 1993-2018**



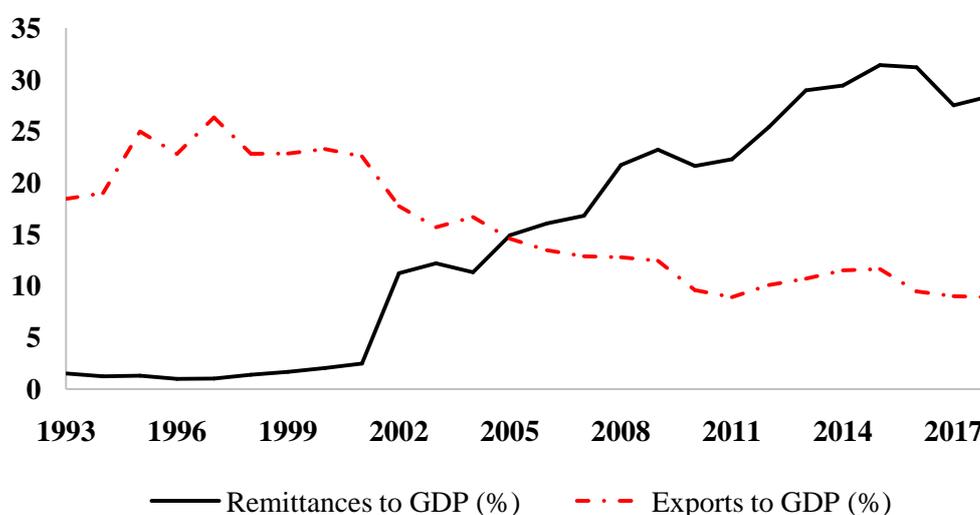
Source: World Development Indicators (2020)

We present the share of remittances and exports in GDP measured in percent for the same period. We find the declining trend of the share of exports over the period, particularly after 1997 when it reached to about 26 percent, recording just about nine percent in 2018. Exports started losing its ground to remittances since 2005 and the remittances share in GDP is leading with the widening gap with the exports share in GDP. For the later period, it is clearly seen that the exports and remittances are almost going in opposite direction or we can say have expressed an opposite behavior. The share of remittances in GDP went up to over 31 percent in 2015 and 2016 and has remained around 28 percent since then.

Due to very small figures of Nepal's export's share in the World's exports, we preferred to put these data in a table as presented in Table 1, which shows a comparison of Nepal's remittances and exports with the world's remittances and exports respectively. The data show that Nepal's remittances share in the World's remittances is increasing over the period from about 0.07 percent to 1.30 percent, while the story of exports largely seem to stagnant, such as, the share of exports was

recorded 0.015 percent in 1993 that comes down to 0.010 percent. Another important point to note is that the share of exports was highest in 2001 but just 0.018 percent, then, it started declining sharply. Without surprise as mentioned earlier, the remittances share started increasing from the same year. In every selected year, the share of remittances of Nepal compared to that of the remittances of the World has increased visibly.

**Figure 2: Share of Exports and remittances in GDP measured in percent, 1993-2018**



*Source: World Development Indicators (World Bank, 2020)*

**Table 1: Nepal's remittances' and exports' share in the World, measured in percent**

Year	Remittance % of World	Exports % of World
1993	0.068	0.014
2001	0.111	0.018
2005	0.479	0.009
2010	0.826	0.008
2015	1.184	0.012
2016	1.187	0.010
2017	1.166	0.010
2018	1.299	0.010

*Source: World Development Indicators (World Bank, 2020)*

### **III. BRIEF LITERATURE REVIEW**

There are few studies focused on remittances and export performance. These studies suggest two important points in the association of remittances and export performance based on different methodologies, countries cases and qualitative analysis. Many of the studies show the negative association of remittances and export performance linking the literature with the Dutch Disease story, such as, as the remittance inflows increases or boosts the imports, and ease the consumption and even push for the bad governance as discussed in Sapkota (2013) so that exports declines due to lack of incentives to take the risk in investment, entrepreneurship and hard work.

The link that remittances harm export performance is via Dutch Disease. Generally, the remittances inflows cause to increase the foreign reserves in the domestic countries results the appreciation of domestic currency in the international market. This behavior results import cheaper and export more expensive so that it harms the export performance of a country in general as suggested by the literature.

In this regard, Kandil and Mirzaie (2008) find a positive contribution of remittances in export growth, using the data from Tunisia. However, the same studies show the negative impact in other countries, such as, Jordan and Egypt. Another study, Bayngos and Jansen (2011) analyze the impact of remittance on the export competitiveness and performance in the case of Philippines and recommend the negative impact in the export performance. Similarly, Chowdhury and Rabbi (2014) investigate the impact of workers' remittance in Bangladesh using annual data for the period of 1971-2008, and suggest that the remittances inflows causes to lose the export competitiveness in line with the story of Dutch disease having negative impact in the export performance.

In the similar fashion, Shamim, et al. (2015) find the negative effect of remittances on export performance in the long run in case of Pakistan using the annual data. Jena and Sethi (2020), using the annual data for South Asian countries for the period of 1993-2017, suggest that remittance inflows are affecting export performance negatively during the study period.

The clear literature gap is that the role of remittances in export performance of Nepal has not been systematically analyzed yet for the selected study period. This scenario justifies the need of research explaining the role of remittances in export performance of Nepal.

#### **IV. RESEARCH METHODOLOGY**

This study focuses on the overall contribution of remittances in export performance employing the secondary data, using gravity modelling approach for a panel data on exports from Nepal to trading partners. The trading partners are selected as importer from Nepal. We use all countries as an importer that import from Nepal in any amount in any of the given year. Also, we estimated the model removing the importer countries that have less than US\$ 1,000 and US\$ 10,000 in a year from the sample, but the results largely remain consistent. So are not reported here.

##### **4.1 The model and econometrics**

We estimate the following benchmark model to investigate the role of remittance in the export performance, using the workhorse model for trade analysis-the gravity model as in equation (1):

$$\begin{aligned} \text{LEXPORT}_{ij,t} = & \beta_0 + \beta_1 \text{LREMIT}_{i,t} + \beta_2 \text{LPOP}_{i,t} + \beta_3 \text{LTPPOP}_{j,t} + \beta_4 \text{LGDP}_{i,t} + \\ & \beta_5 \text{LTPGDP}_{j,t} + \beta_6 \text{LDIS}_{ij,t} + \beta_7 \text{CONTIG}_{ij,t} + \varepsilon_{ij,t} \end{aligned} \quad \text{..... (1)}$$

Where,  $t$  refers to year and the value is 1 to 26,  $i$  refers to Nepal,  $j$  refers to Nepal's trading partners,  $\text{LEXPORT}$  is natural log of exports in US\$ and is the dependent variable. This represents total export from Nepal to its individual trading partners annually.  $\beta_0$  is constant intercepts and  $\beta_1, \beta_2, \dots, \beta_7$  are coefficients of independent variables,  $\text{LREMIT}$  is the natural log value of remittance measured in US\$,  $\text{LPOP}$  is the natural log of population of Nepal,  $\text{LTPPOP}$  is the natural log of population of Nepal's trading partners,  $\text{LGDP}$  is the natural log of Nepal's GDP in US\$,  $\text{LTPGDP}$  is the natural log of the GDP of the trading partners of Nepal measured in US\$,  $\text{LDIS}$  is the natural log of the distance between the largest business cities of Nepal and trading partners measured in Kilometers, and  $\text{CONTIG}$  is a dummy to represent the border countries of Nepal, that is it represents the

neighboring countries, India and China. We expect here all the coefficient of the independent variables to be positive except of LDIS, which represent the distance that is associated with the trade costs directly.

The last term of the equation (1) is the error term. The error component structure is presented in equation (2):

$$\varepsilon_{ij,t} = \mu_{ij,t} + \theta_t + \varphi_{ij,t} \quad \dots\dots\dots (2)$$

Where,

$\mu_{ij,t}$  is a fixed effect that might be correlated with explanatory variables,  $\theta_t$  captures the time-specific effects common to all cross-section units, and  $\varphi_{ij,t}$  is an error term uncorrelated across cross-section units and over time periods.

The model is estimated using fixed effect (FE) and random effect (RE) estimation method. We note that the partner countries may have specific fixed effect as discussed in Borenstein et al. (2010), therefore, we estimate the benchmark model using FE at first. The problem with the FE is that it drops the time invariant variables without estimating their coefficients. Considering this limitation of FE, once we know the coefficients of LREMIT, we estimate the benchmark model using RE so that gravity variables, such as, distance and boarder are used in the estimation. Then, we use RE to check the robustness in the alternative specifications of the model.

#### 4.2 Data and sources

The model is estimated using a panel data set of bilateral export from Nepal to its trading partners over the period of 1993-2018. The data for exports, GDP, remittance, and populations are collected from World Bank (2020) are linearly interpolated to fill in the gaps for some years. Exports, GDP and remittances are measured in US\$, while population in number. The distance and border data were compiled from CEPII (2016).

### **4.3 Results**

We use an augmented gravity modelling technique to estimate the impact of remittances in export performance of Nepal. The econometric estimation of this paper suggests some important findings on Nepal's exports. We use four specifications of the benchmark gravity model and the results are presented in the different four columns of Table 2.

As can be seen in the column (1) in the Table 2, the results for remittance (LREMIT) show that remittance inflows have a strong negative association in the export performance. The finding suggests that a one percent increases in remittance inflows causes to decrease the export performance by on average about 0.20 percent, holding other variables in the model constant. This result is consistent in all specifications of the model as can be seen in all columns of the Table 2. Our finding for this variable is in line with the literature and supports to the findings of Jena and Sethi (2020) and others that suggest remittances inflows causes to decline the export performance in different cases.

In our model, it seems that the only strong and positive contributor for export performance of Nepal is trading partners' GDP, which is used as a proxy of the size of the economy. The results for this variable indicate that a one percent increase in GDP of the trading partners causes to increase the export performance on average by one percent or more, holding other variables in the model constant. Therefore, it can be said that improving trading relationships with large economies helps to improve the export performance.

The trading partners' population seems to have negative impact in the export performance of Nepal. The results, however, not significant in the FE estimation, suggest that trading partners' population deters Nepal's export performance. This may be, in the large countries in terms of population, would prefer to buy the bulks quantity of goods for which Nepal's supply side factors limit. Therefore, the large countries prefer to trade with other countries for imports. Nepal's GDP itself is not contributing to boost the export performance, however, it is positive, but not statistically significant. This result indicates that Nepal needs to think on how the growing GDP would be meaningful to boost the export performance. The result

seems to be more realistic as the growth of export is almost stagnant during the recent decades despite the economic growth over five percent on average.

**Table 2: Gravity modelling results, 1993-2018**

Dependent variable: Exports USD log (LEXPORT)	(FE)	(RE)	(RE)	(RE)
Remittance-log US\$ (LREMIT)	-0.177** (0.081)	-0.213*** (0.078)		-0.212*** (0.078)
Population of Nepal-log (LPOP)	1.559 (1.472)	1.608 (1.451)	-1.046 (1.280)	1.590 (1.449)
Population-trading partners-log (TPPOP)	-0.398 (0.519)	-0.295*** (0.082)	-0.247*** (0.084)	-0.262*** (0.085)
GDP of Nepal-log US\$ (LGDP)	0.347 (0.214)	0.117 (0.200)	-0.140 (0.165)	0.115 (0.200)
GDP-trading partners-log US\$ (TPGDP)	0.820*** (0.187)	1.182*** (0.089)	1.163*** (0.089)	1.180*** (0.088)
Distance-log-Kmt (LDIST)	dropped	-1.214*** (0.257)	-1.294*** (0.263)	-1.298*** (0.264)
Border -dummy (CONTIG)	dropped	2.490** (1.161)		
Number of observations	2,539	2,539	2,539	2,539
Number of groups	167.00	167.00	167.00	167.00
F (FE)/Wald statistics (RE)	15.14	391.40	329.54	346.22
R-squared	0.56	0.72	0.71	0.71
Correlation (RE)	0.540	-	-	-

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.

As a well-established fact in the other literature, the distance has a negative impact in all specification, indicating that a one percent increase in the distance, on average, causes to decline the exports by about one and a quarter percent holding other variables in the model constant. This study suggests that the distance is the largest

detractor of the export performance of Nepal. Another gravity variable, border dummy is statistically significant at five percent level of significance, indicating exporting to the border countries, that is, China and India help to increase the export values. Naturally, exporting to these two countries is cheaper than to export to the rest of the world. Maintaining export destination diversification is one issue, but one way to improve the export performance may be to research well the demand of goods and services in China and India.

The diagnostic tests of the econometric estimation seem satisfactory. The R-square value is moderately high, around 70 percent, except in FE estimation of 56 percent, on average in all specifications. This value shows that the overall goodness of fit of the model is moderately high. F-statistics and Wald statistics are high enough to validate the results are credible and robust.

## **V. CONCLUSION**

Role of workers' remittance seems to be an indispensable part of Nepalese economy for about one and half decades. The remittances inflow has supported to maintain the foreign reserves at the national level and consumption in household level. This paper analyses role of workers' remittances inflows in the export performance of Nepal using the gravity modelling approach following the standard procedures. For this purpose, at first, we document the scenario of remittances and export nexus, and then move to econometric estimation for the exports flows from Nepal to its trading partners. As a part of research methodology, we augmented the original gravity model to include remittance as a control variable in the story.

The major findings of this research indicate that the role of remittances seems, as indicated by the results, to be negative for export performance. Specially, the case of remittance seems to be related with the Dutch disease story. Relying on remittances instead of employing the youth forces in the country, particularly in the manufacturing sector, adversely impacts the export performance and stimulates the imports.

The major policy inferences from the study are that it may be a good idea to focus to trade with large and rich economies for the better performance of the exports. There is an urgent need to connect the remittance with the entrepreneurs rather than just feeding the imports, and the export strategies should be supported by the remittance management strategies. Also, the study suggests for an urgent attention from policy makers to make the remittance in favor of exports by developing the export strategies. One idea can be managing some provision of compulsory investment in the productive sector from the remittances to motivate the exports related manufacturing sectors. In this regard, a special focus to export to the rich economies may be a good way to boost the export performance of Nepal, and this is in line with the high-value-to-weight product's story.

## REFERENCES

- Bayangos, V., and K. Jansen. 2011. "Remittances and competitiveness: The case of the Philippines." *World Development* 39(10): 1834-1846.
- Borenstein, M., Hedges, L. V., Higgins, J. P., and H. R. Rothstein. 2010. "A basic introduction to fixed-effect and random-effects models for meta-analysis." *Research synthesis methods*, 1(2): 97-111.
- Chowdhury, M. B., and F. Rabbi. 2014. "Workers' remittances and Dutch disease in Bangladesh." *The Journal of International Trade and Economic Development*, 23(4): 455-475.
- Government of Nepal. 2017. "online database", the Department of Cooperatives, ( Accessed on 2019/07/26)
- Jena, N. R., and N. Sethi. 2020. "Does inward remittance lead to export performance in South Asian countries?" *International Journal of Social Economics*, 47(2): 145-172.
- CEPII. 2016. The CEPII Gravity Dataset <http://www.cepii.fr/anglaisgraph/bdd/gravity.asp> (Accessed on 16/04/2016).

- Galindo, M.-Á., and M. T. Méndez. 2014. "Entrepreneurship, economic growth, and innovation: Are feedback effects at work?" *Journal of Business Research*, 67(5): 825-829.
- Kandil, M., and I. Mirzaie. 2008. "The impact of capital and remittances flows on economic performance in MENA countries." *World Economics*, 10(3): 159-192.
- Majee, W., and A. Hoyt. 2011. "Cooperatives and community development: A perspective on the use of cooperatives in development." *Journal of Community Practice*, 19(1): 48-61.
- Paudel, R. C. 2007. "Financial liberalisation in Sri Lanka: an econometric analysis" Unpublished Dissertation, Wollongong University, Australia.
- Paudel, R.C. 2016. "Liberalization Reform and Export Performance of India." *Journal of Economics and Economic Education Research*, 17(3): 201-219.
- Paudel, R. C. 2019. "Exports Performance of Nepal: What Can Be Done?" *Applied Economics and Finance*, 6(5): 92-103.
- Paudel, R. C., and J. K. Kankesua. 2009. "Financial Liberalization and Performance in Sri Lanka: The ARDL Approach." *South Asia Economic Journal*, 10 (1): 127-156.
- Sapkota, C. 2013. "Remittances in Nepal: boon or bane?" *The Journal of Development Studies* 49(10): 1316-1331.
- Shamim, M. A., Panhwar, I. A., Rizvi, S. M. A., and Shaikh E. A. 2015. "Impact of Remittances On Export Performance: Time Series Evidence from Pakistan." *IBT Journal of Business Studies (JBS)*, 11(2): 11-10.
- Tinbergen, J. 1962. *Shaping the world economy: Suggestions for an international economic policy*. New York: Twentieth Century Fund.
- World Bank 2020. World view States and markets Source : World Development Indicators database, 2020: [http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report\\_Name=CountryProfileandId=b450fd57andtbar=yanddd=yandinf=nandzm=nandcountry=NPL](http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report_Name=CountryProfileandId=b450fd57andtbar=yanddd=yandinf=nandzm=nandcountry=NPL)