Remittances, Economic Growth and Investment Nexus: Evidence from Nepal

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Abstract

This paper assesses the contribution of remittances on GDP and private gross fixed capital formation of Nepal by employing the ARDL bound test approach. The model incorporates the level of financial development, and the institutional quality of Nepal as regressors in addition to the macroeconomic regressors recognised by the literature. Perron's (1997) innovation outlier model of breakpoint unit root test has been used to confirm the suitability of the variables in the ARDL bounds test approach. The findings show a positive effect of remittances on GDP while a negative effect on private gross fixed capital formation. The paper concludes that remittances do not act as a source of capital flows in the context of Nepal, rather they behave as compensatory transfers to the recipient households. To align remittances in productive activities such as self-employment, financial investment, etc., a remittance-focused policy is advised to reach out the recipients and provide them rigorous advisory and training supports.

Key Words: ARDL, Economic Growth, Investment, Nepal, Remittance

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I. INTRODUCTION

Remittances in Nepal started to surge from fiscal year 1999/00 surpassing 10 percent of GDP and making remittances a major source of foreign exchange reserve. In fiscal year 2019/20, Nepal recorded NPR 875 billion remittances (NRB, 2020) constituting 23.3 percent of GDP which is significantly larger than the collective amounts of gross exports, official development assistance, and foreign direct investment in Nepal. However, the studies of CBS (2011) and NRB (2012 & 2016) have shown that only about 3.5 percent of remittances has been used in the productive uses such as capital formation and business activities, while above 70 percent of remittances has been used in the daily consumptions in Nepal. Though the consumption of remittances on health and education can be seen as a long-term investment on human capital development, the policymakers intend to see the utilisation of remittances in creation of job opportunities, enhancement of entrepreneurship and production activities, boosting national economic growth, among others. Therefore, the debate over the productive use of remittances still prevails among the policy makers in Nepal who have perceived remittances as a source of capital flow and expect the recipients to invest a significant proportion of remittances in the activities that would contribute to the production and employment activities.

The direct economic benefits of remittances to the recipient economies pour via channels such as consumption of domestic items or domestic capital formation or creation of savings. However, these benefits of remittances are not granted. These depends upon some underlying factors such as motive of the majority of the migrant workers (Alper and Neyapti, 2006), years of migration (De Hass, 2003), level of financial development, institutional quality and investment climate in the recipient economies (Bjuggren et al., 2008)[1]. Studies such as Barajas et al.,

[1] Alper and Neyapti (2006), based on evidence from Turkey, found that the productive investment of remittances is a long-run motive of migrant workers, while in short-run, they focus on smoothening of family consumptions. Based on evidence from Morocco, de Haas (2003) found that remittances are used for investments purpose only after 14 years of migration. In the first 14 years, remittances are used in housing investments. Bjuggren et al., (2008) after analysing the panel data of 79 developing economies, found that the productive uses of remittances depend on the level of financial development, the institutional quality and investment climate back in the home country.

(2009); Aggarwal et al., (2011); Lartey (2013); and Dzansi (2013) have found a positive impact of remittances on capital formation while Mallick (2012) and Tung (2018) have denied any such effect of remittances. A similar situation prevails in assessing the empirical relationship between remittances and economic growth. Chami et al., (2005) found a negative correlation between remittances and GDP growth rates concluding that remittances are not profit-driven rather compensatory transfers. Rapoport and Docquier (2005) also found that remittances discourage labor supply and work effort among recipients resulting in increased dependency, lower productivity and delayed growth. Nonetheless, Stark (1991) argues that remittance can be used to purchase both financial and physical assets which can support productive activities like farm investments and entrepreneurial formation. The literature review, therefore, does not provide a conclusive answer regarding the impact of remittances on investment and economic growth. A similar state of inconclusiveness also prevails in the context of Nepal (see section 2). Therefore, this study has assessed the nexus of remittances, economic growth, and private investment in the context of Nepal by incorporating the level of financial development, and the institutional quality of Nepal apart from some important macroeconomic indicators recognised from literature. Rest of the paper has been structured as follows. Section II presents a brief literature review undertaken in the context of Nepal in the course of this study while section III discusses the methodological framework that has been adopted in this study. Section IV presents the empirical findings followed by a brief discussion on the findings in section V. Section VI concludes the paper.

II. BRIEF LITERATURE REVIEW

A considerable number of studies viz. Ojha (2019), Dhungel (2018), Acharya (2017), Uprety (2017), Thagunna and Acharya (2013), Srivastava and Chaudhary (2007), Gaudel (2006), have been undertaken in the context of Nepal assessing the contribution of remittances to the growth variables such as real GDP, real GNP (gross national product) and real PCI (per capita income). All of these studies except Uprety (2017) agree that remittances generate a positive effect on GDP. In contrary, Uprety (2017) concludes a negative effect of remittances on GDP and per capita income of Nepal. Nonetheless, the degree of effect of remittances varies from each other depending upon differences in the study periods, approaches to data analysis,

and the choices of regressors. Moreover, these studies have employed macroeconomic indicators such as capital formation, exports, money supply, trade openness and foreign aid only as the regressors and have not incorporated the level of financial development and the institutional quality of Nepal as factors that might have affected the effectiveness of remittances. In addition, the studies that have spanned before year 2006 to beyond year 2015, for example Ojha (2019), Dhungel (2018), and Acharya (2017) have also not incorporated test for structural breaks[2] in the variables under consideration in their data analyses. Such structural breaks might have taken place in the series of macroeconomic variables due to the 2006 Democracy Movement, and (or) the 2015 Earthquake in Nepal. Therefore, exclusion of level of financial development and the institutional quality in the analytical models and ignoring structural breaks in the variables' series are noticeable research gaps in assessing the true contribution of remittances in Nepal. In addition, the impact of remittances on domestic capital formation has not been explicitly assessed yet. These gaps, therefore, were the sources of motivation for this study.

III. METHODOLOGY

This paper has examined the dual contributions of remittances in the context of Nepal- firstly, to the real GDP; and secondly, to the domestic private investment, proxied by private gross fixed capital formation, by employing the ARDL (autoregressive distributed lags) bounds test approach to confirm whether a long-run relationships exists among the variables in question. In this approach, though pretesting the order of integration of variables in question is not essential, it requires that none of the variables' series shall be integrated higher than one, I(1). In light of this requirement, Perron's (1997) innovation outlier (IO) model[3] of breakpoint unit root test has been used to confirm the suitability of the variables in ARDL bounds test approach. After bound test confirmation, Wald coefficients test has been

[2] Structural breaks are unexpected changes in the intercept and (or) trend of the time series of variables due to the effects of major events such as regime change, change in policy direction, external shocks, war, etc.

[3] This method allows incorporation of structural breaks into analysis. The reason for choosing this approach of unit root test is the caution by Perron (1989) that the long-span data may include effects of major events, i.e. structural breaks, which may behave as outliers. His work on re-examining Nelson and Plosser's work (1982) has already established this fact. Also, in light of 2006 Democratic Movement and the devastating 2015 Earthquake, possibility of structural breaks cannot be ignored in the time series of macroeconomic variables of Nepal.

undertaken to confirm whether any short-run causality relationship exists between the dependent variable and the underlying regressors.

3.1 Sources of Data

This study covers a period of fiscal year 2000/01 to 2019/20[4]. The data of current GDP, GDP deflator, gross and private fixed capital formation, gross domestic savings, and gross exports of goods and services have been taken from the published reports of Central Bureau of Statistics (CBS, 2021), Nepal. Likewise, the data on remittances, and gross bank deposits have been taken from the published reports of Nepal Rastra Bank (NRB, 2021), and the data on the political stability index has been taken from the World Bank (2020a). The real value of variables in question have been computed by dividing their current values by GDP deflator of respective year.

3.2 Models

The following two models have been proposed to assess the dual objectives of the study as mentioned above. The equation (1) would assess the contribution of remittances on the real GDP; and the equation (2) would assess the contribution of remittances on private gross fixed capital formation, which has been treated as a proxy for domestic private investment. The final regressors have been selected after examining the statistical robustness of several permutations of probable regressors in the models.

The equation (1) proposes that the gross domestic product of Nepal is a function of remittances, gross fixed capital formation, and gross exports. In addition, an interactive term has been introduced in the model to examine any impact of remittances on gross domestic product via banking platform.

$$\ln GDP_r = f(\ln RM_r, \ln GFCF_r, \ln X_r, \ln RM_r * \frac{D}{GDP}) \quad \ldots\ldots\ldots (1)$$

Where 'ln' represents the log-transformation of the variables' series. This transformation has been done to remove any exponential variance present in the

[4] The proportion of remittances to the GDP of Nepal became significant only from fiscal year 1999/00 onward. In addition, the data of 'political stability index' are available from year 2000 onward only.

series. GDPr is the real value of gross domestic product, RMr is the real value of remittances inflows, CFGFr is the real value of gross fixed capital formation, and Xr is the real value of gross exports, all for Nepal and base year in 2000/01. In this model, the real value of remittance has been introduced together with the gross fixed capital formation and gross exports so that a comparative assessment can be done on remittances' contribution to the real GDP. In addition, as reported by CBS (2011) and NRB (2012 & 2016), a part of remittances also forms the gross deposits in the banks and financial institutions which would contribute to the economic growth differently. Therefore, an interactive term, $\ln RMr^{*}\frac{D}{GDP}$ has been introduced as a proxy for the fraction of remittances in the banking channel. In this interactive term, $\frac{D}{GDP}$ is the current gross bank deposits (D) as percent of GDP which is also a proxy for the level of financial development[5].

The equation (2) proposes that domestic private investment in Nepal is a function of remittances, domestic savings, level of financial development and institutional quality in Nepal.

$$\frac{P\_GFCF}{GDP} = f\left(\frac{RM}{GDP}, \frac{GDS}{GDP}, \frac{D}{GDP}, DUM\right) \quad \ldots\ldots\ldots (2)$$

Where $\frac{P\_GFCF}{GDP}$ is the current value of private gross fixed capital formation as percent of GDP and a proxy for domestic private investment; $\frac{RM}{GDP}$ is the current remittances as percent of GDP; $\frac{GDS}{GDP}$ is the current gross domestic savings as percent of GDP; $\frac{D}{GDP}$ has the same interpretation as in equation (1); and DUM[6] is the dummy variable for

[5] Giuliano and Ruiz-Arranz (2005) have recommended four proxies to represent financial development of an economy. These are: (i) liquid liabilities of the financial system (M2/GDP); (ii) the sum of demand, time, saving and foreign currency deposits to GDP (DEP/GDP); (iii) claims on the private sector divided by GDP (LOAN/GDP); and (iv) credit provided by the banking sector to GDP (CREDIT/GDP).

[6] The dummy variable has been developed from the 'political stability index (-2.5 weak; 2.5 strong)' developed and published by the World Bank (2020a). For Nepal, this index has never been positive since year 2000. However, the score has shown a sign of improvement after year 2016 (score = -1.0), i.e. after 2016, the scores are less negative. Hence, the negative unity value has been set as a cutoff point, and the years that have had scores below negative unity has been coded as 1

political instability (1 if political stability index ≤ -1; otherwise 0), which is also a proxy for the institutional quality. In this relationship, remittances have been considered as a source of capital financing together with the gross domestic savings. Such a role of remittances is supported by many studies[7] that argue that remittances have tendency to stimulate private investments through banking channels. Since the level of financial development is expressed as percent of GDP (i.e., $\frac{D}{GDP}$) in this model, both remittances and gross domestic savings have also been also measured as percent of GDP in order to make regressors aligned and comparable with the dependent variable. In equation (2), the effects of remittances, and financial development on investment are expected to be positive, while that of the gross domestic savings, and political instability are expected to be negative.

3.3 Selection of Variables

The studies mentioned in section (2) have used a range of regressors to examine the economic contributions of remittances on the growth variables (Table 1). Among these variables, remittances (RM), gross fixed capital formation (GFCF), and gross exports of goods and services (X) have been chosen as macroeconomic indicators and the gross bank deposits as percent of GDP as a proxy for the level of financial development. All of these regressors are expected to show positive effects on the real GDP of Nepal. Many other regressors viz. consumption, imports, number of school enrollment, grants, etc., have been dropped off from the model on the following three grounds: firstly, they are closely related with the chosen regressors, for example, trade openness is closely linked with the gross exports of goods and services; secondly difficult to quantify directly, for example, the purpose of number of secondary school enrollment is to incorporate the human capital effects of remittances, but the author realised that it will be a weak regressor to capture the human capital effects as such; and thirdly the robustness of the given model would get compromised if too many regressors are employed into the model. A similar approach has been undertaken while choosing the regressors for equation (2).

(one) to indicate years of political instability, otherwise 0 (zero) to indicate years of political stability.

[7] Some of such studies are Giuliano and Ruiz-Arranz (2005), Chami et al., (2005), Bjuggren et al., (2008), Mundaca (2009), Aggarwal et al., (2011), Dash (2020), Gelb et al., (2021), etc.

Table 1: Selection of significant regressors from the literature in the context of Nepal

Studies	Regressors used in the model	Highly significant regressors
Ojha (2019)	Remittance, capital formation, broad money supply, foreign aid, and import	Capital formation, remittance, import, and broad money supply
Dhungel (2018)	Remittance, trade openness, gross fixed capital formation, and secondary school enrollment	Gross fixed capital formation, Secondary school enrollment, remittance, and trade openness
Acharya (2017)	Remittance, fixed capital formation, and total merchandised exports,	Fixed capital formation, remittance, and total merchandised exports
Uprety (2017)	Remittance, consumption, and gross capital formation	Consumption, gross capital formation, and remittance
Thagunna and Acharya (2013)	Consumption, savings, investment, imports, and exports	No empirical estimates.
Srivastava and Chaudhary (2007)	Remittance, fixed capital formation, labour force, and gross exports	Fixed capital formation, gross exports, labour force, and remittance
Gaudel (2006)	Remittance, and grants	Grants, and remittance

Source: Author's contribution.

IV. EMPIRICAL FINDINGS

4.1 Test for Breakpoint Unit Root

The appropriate form of Perron's (1997) innovation outlier model, i.e., IO2 or IO1, has been chosen based on significance checks of ADF statistics, and is supported by significance checks of break type of the model[8]. The significance of break dummy

[8] Checking significance of both intercept break and trend break in IO2 model; and intercept break in IO1 model.

has been examined additionally for the dependent variables. The break date has been chosen by minimizing the Dickey-Fuller t-statistics, and the optimal lag length was set automatic to be chosen by the software[9] based on the Akaike information criteria (AIC). Estimated results have been presented in Appendix A.

The following five variables' series {lnGDPr}, {lnGFCFr}, {lnXr}, $\{\frac{D}{GDP}\}$, and $\{\frac{GDS}{GDP}\}$ have been found of integration order zero, I(0) in their level forms; while four variables' series {lnRMr}, {lnRMr*$\frac{D}{GDP}$}, $\{\frac{P\_GFCF}{GDP}\}$, and $\{\frac{RM}{GDP}\}$ were found of integration order one, I(1). The explanation on the appropriate models and significance checks of break type, and break dummy have been provided under remarks in Appendix A. Nonetheless, none of these variables' series have shown integration of order two, I(2), and thus ARDL bounds test can be applied to examine a long-run relationship among the variables in question[10].

[9] Eviews 10

[10] The order of integration of {LNGDPr}, the dependent variable for equation (1) is found to be zero. In some online discussion forum (for example, Can we use an ARDL model if dependent variables are stationary at level while independent variables have mixed order of integration? (researchgate.net)), there is an argument that in such a situation, an ARDL approach shall not be applied though, but there is no concrete evidence to support this claim. Pesaran et al., (1999 and 2001) have also not explicitly discussed about such requirement in their works. Nonetheless, literature implies that if a long-run relationship statistically exists among variables in question, then the orders of integration of variables, whether I(0) or I(1) really do not matter in ARDL bounds test approach.

4.2 Selection of Optimum Lag Lengths

The optimal lag lengths to incorporate in the ARDL bounds test for both models (eq. 1 and eq. 2) have been determined by undertaking unrestricted VAR equation on the respective endogenous variables used. Since the number of annual observations is less, i.e., 20, the maximum lags allowed by the system was 2. The majority of the criteria including AIC indicate a suitable lag length of 2 for both models (Table 2).

Table 2: Lag lengths selection by criteria

Model	Lag	LogL	LR	FPE	AIC	SC	HQ
Eq. 1	0	-53.1014	NA	0.000438	6.455716	6.703042	6.4898
	1	48.0918	134.9243*	1.05e-07	-2.0102	-0.5262*	-1.8056
	2	81.9366	26.3237	9.34e-08*	-2.9929*	-0.2724	-2.6178*
Eq. 2	0	-199.5036	NA	5083.803	22.7226	22.9699	22.7567
	1	-123.6989	101.0730*	20.5051	17.0777	18.5616*	17.2823
	2	-89.8103	26.3578	18.1101*	16.0900*	18.8106	16.4652*

* Indicates lag order selected by the criterion; LR: Sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.

Source: Author's estimate.

4.3 Estimation of ARDL Models and Checking Their Robustness

Various permutations of lag lengths 1 and 2 on dependent variable and regressors, and trend specification were examined under automatic selection setting, with one time break-dummy of dependent variable as fixed regressor to obtain the most suitable ARDL model for each equation. In the end, ARDL(1, 2, 2, 1, 0) with specification 'restricted constant and no trend' was found the most suitable model for equation (1); and ARDL(1, 2, 2, 2, 0) with specification 'restricted constant and no trend' was found the most suitable model for equation (2). After this, Breusch-Godfrey LM test was applied to confirm that the errors of these models were not serially correlated; results of which have been presented in Table 3. Since the 'observed R-square' values for both models are insignificant within 5 percent level, the null hypothesis of the test that 'there is no serial correlation in the model's

residual' cannot be rejected. This confirms that the chosen ARDL models are free from serial correlation. After this, the stability of these models has been examined by using CUSUM test and found that the CUSUM statistics for both models lie within 5 percent critical bands, thus showing absence of any instability of the coefficients in the selected models.

Table 3: Results of Breusch-Godfrey Serial Correlation LM Test

Model	F-statistic	Probability	Observed R-square	Prob. Chi-Square (2)
Eq. 1	0.4928	F(2,4) = 0.6437	3.5584	0.1688
Eq. 2	0.0817	F(2,3) = 0.9235	0.9302	0.6281

Source: Author's estimate.

4.4 Bounds Test of Cointegration and Error Correction Model

The F-statistics of bounds test for both ARDL models have been found larger than the asymptotic critical value of Pesaran et al., (2001), and the finite sample critical value of Narayan (2005) at 1 percent level (Table 4). That means the null hypothesis of 'no long-run relationship exists among the underlying variables in their level forms' can be rejected at 1 percent level, thus validating the existence of a long-run relationship between dependent variables and respective regressors in their level forms.

Table 4: Results of Bounds Test

		Significance asymptotic: n=1000 Pesaran et al., (2001), k = 4				Significance finite sample: n=30 Narayan (2005)			
		1%		5%		1%		5%	
Model	F-statistic	I0	I1	I0	I1	I0	I1	I0	I1
Eq. 1	60.2758***	3.29	4.37	2.56	3.49	4.28	5.84	3.06	4.22
Eq. 2	19.9558***	3.29	4.37	2.56	3.49	4.28	5.84	3.06	4.22

*** Significant at 1 percent level, k = the number of regressors in the model.

Source: Author's estimate.

After establishing a long-run relationship among the underlying variables, the cointegration equations for both models have been estimated. The coefficients and other statistical characteristics of those regressors have been presented in Table 5. The remittances and gross fixed capital formation have shown positive effects on GDP and are significant within 5 percent level. The effect of gross exports of goods and services on GDP is also positive, though significant at 10 percent level only. Interestingly, the interactive term of remittances with the financial development, proxied by gross deposits as percent of GDP has shown a negative and marginal effect on GDP. This observation has been discussed in detail in section V. In terms of comparative contributions, the remittances fall behind the gross fixed capital formation and gross exports of goods and services. One percent increase (decrease) in the real value of remittances causes the real GDP to increase (decrease) by 0.45 percent only while that of the gross fixed capital formation causes by 1.11 percent, and the gross exports by 0.59 percent. The value of error correction term is negative and significant at 5 percent level and shows that a disequilibrium in the value of the real GDP due to nonproportionate contributions of regressors is corrected by 18.5 percent per year towards maintaining its long-run equilibrium relation with the regressors, ceteris paribus, which is a moderately slow speed of adjustment.

On the other hand, remittances, gross domestic savings, and political instability have shown negative effects on the domestic private investment. Numerically, one percent increase (decrease) in remittances as percent of GDP causes a decrease (increase) of 0.30 percent in domestic private investment. The gross domestic savings as percent of GDP causes the domestic private investment to shrink by 0.90 percent; while a politically unstable year causes it to shrink by 3.2 percent. In this way, the political instability has had a massive consequence on the domestic private investment. As expected, the level of financial development has shown a positive effect, and one percent increase in gross bank deposits as percent of GDP causes domestic private investment increase by 0.26 percent. The value of error correction term is negative and significant at 1 percent level and shows that any disequilibrium in the value of domestic private investment is corrected by 92.1 percent every year towards maintaining its long-run equilibrium relation with the regressors, ceteris paribus, which is a quick adjustment.

Table 5: Results of cointegration equation

Equation 1 Dependent variable: lnGDPr				Equation 2 Dependent variable: $\frac{P\_GFCF}{GDP}$			
	Co-eff.	SE	t-stat		Co-eff.	SE	t-stat
lnRMr	0.450**	0.1316	3.4173	$\frac{RM}{GDP}$	-0.299*	0.1275	-2.3437
lnGFCFr	1.113**	0.3330	3.3440	$\frac{GDS}{GDP}$	-0.903***	0.1570	-5.7538
lnXr	0.588*	0.2804	2.0993	$\frac{D}{GDP}$	0.259***	0.0564	4.5832
lnRMr*$\frac{D}{GDP}$	-0.002*	0.0007	-2.2827	DUM	-3.191**	1.0954	-2.9134
Constant	-10.141	7.5736	-1.3389	Constant	22.433***	2.5159	8.9167
ECT	-0.185**			ECT	-0.921***		

***, ** & * indicate significant at 1 percent, 5 percent, and 10 percent level. ECT = Error correction term.

Source: Author's estimate.

4.5 Short-Run Causalities in the Model

The short-run causality in the models has been examined by using Wald coefficients test on each model, to confirm the joint significance of the lagged regressors on the dependent variables[11]. The estimates have been presented in Table 6. Since the estimated F-statistics of all the regressors except $\frac{RM}{GDP}$ in equation (2) are greater than the upper bound value of Pesaran et al., (2001) within 5 percent level of significance, the short-run causality runs from these regressors in question to the dependent variable, that means these variables have had short-run effect too, on the dependent variables. Thus, the remittances do have effect on GDP of Nepal in short-run too, but it does not have effect on the domestic private investment in short-run.

[11] The guideline is that if the estimated F-statistic in Wald test is greater than the upper bound value, (i.e. I1) of Pesaran et al., (2001) within 5 percent level of significance, the short-run causality runs from the regressor in question to the dependent variable.

Table 6: Results of Wald Test

				Asymptotic critical value bounds for the F-statistic#, k=4 (Case II: Restricted intercept and no trend)			
				1% Significance		5% Significance	
	Regressor	F-statistic	df	I0	I1	I0	I1
Eq. 1	lnRMr	7.0404***	(3,6)	3.29	4.37	2.56	3.49
	lnGFCFr	33.4928***	(3,6)	3.29	4.37	2.56	3.49
	lnXr	28.6613***	(2,6)	3.29	4.37	2.56	3.49
	lnRMr* $\frac{D}{GDP}$	59.8506***	(1,6)	3.29	4.37	2.56	3.49
Eq. 2	$\frac{RM}{GDP}$	1.5572	(3,5)	3.29	4.37	2.56	3.49
	$\frac{GDS}{GDP}$	12.5972***	(3,5)	3.29	4.37	2.56	3.49
	$\frac{D}{GDP}$	5.6519***	(3,5)	3.29	4.37	2.56	3.49
	DUM	16.2835***	(1,5)	3.29	4.37	2.56	3.49

Pesaran et al., (2001, p.300), k= number of regressor, *** indicates significant at 1 percent level.

Source: Author's estimate.

V. DISCUSSION

5.1 Discussion on the Findings of Equation (1)

The positive effect of remittances on GDP is in line with the findings of many other studies in the context of Nepal, and the estimated contribution is higher than the estimates of Dhungel (2018) and Acharya (2017), and slightly smaller than the estimate of Srivastava and Chaudhary (2007). Since a larger chunk of remittances is spent on the daily consumptions which has led to the increased import bills of Nepal (Bhatt, 2013), the positive effect of remittances on GDP is oozing out as net of the positive contribution of private domestic consumptions and negative contribution of imports on GDP. Nonetheless, remittances are still not a prime mover for the economic growth of Nepal and lags significantly behind the contributions of gross fixed capital formation and gross exports. The findings clearly establish that gross

fixed capital formation is the prime mover for the economic growth of Nepal. This conclusion is additionally important for the policymakers of Nepal in terms of recognizing the lags for struggling economic growth in the country. A sluggish change in gross fixed capital formation, which is a usual story in the context of Nepal, is ultimately expected to result into a sluggish GDP growth rate. Therefore, a leap in GDP growth will require a similar leap in the level of gross fixed capital formation as well. Priority to exports can also spur economic growth to Nepal by allocating resources to the most competitive sectors, increasing the efficiency of the economy, and generating employment opportunities for unskilled labourers. However, it will require a massive investment in infrastructures to improve its connectivity, and also strategic recognition of competitive export products based on their value addition. In addition, the sustainability of the export-led economic growth model also requires Nepal to participate into deep preferential trade agreements with the strategic trade partner nations. Interestingly, the coefficient of interactive term of remittances with the level of financial development is negative. Though its value is very small and is also found statistically significant at 10 percent level only, the sign is alarming. It indicates that the fraction of remittances deposited in the banks and financial institutions does not make productive impact on GDP which is a subject matter for future research.

5.2 Discussion on the Findings of Equation (2)

Giuliano and Ruiz-Arranz (2005) and Aggarwal et al., (2011) argue that remittances increase bank deposits which increases loanable funds which in turn will increase credit to the private sector, thus leading to a positive relationship with investment. However, the coefficient of remittances in this model is negative though loosely significant at 10 percent level. Such outcome of remittances happens in the following three situations: firstly, when remittances are extremely used for consumption leading to withdrawal of resources from investment activities (Ahamada and Coulbaly, 2013; Tung, 2018); secondly, when the recipient households are not economically stable and lack entrepreneurial abilities (Buckley and Hofmann, 2012), and thirdly when recipient households gradually draw their engagement from productive investment activities, also known as dependency syndrome (Mallick,

2012). In light of key demographic findings of NRB (2016)[12], all of these factors seem applicable in the context of Nepal. Therefore, this finding indicates that remittances do not act as a source of capital flow for economic growth. Ghosh (2005) also argues that remittances in themselves are not capital flows and are mainly a contribution to the family budget. Chami et al., (2005) also have had a similar conclusion and argue that remittances are compensatory transfers characterised by altruism of the senders in terms of compensating the recipients' bad economic outcomes. Defining remittances as compensatory transfers has a special implication at this juncture. That is, remittances will increase when there is uncertainty in the income of the recipient households. This is evidenced by a recent realisation of Nepal. The remittances to Nepal increased by 8.2 percent in fiscal year 2020/21 (NRB, 2021) despite a decrease in the foreign employment approvals due to pandemic, and a prediction to contract by 12 percent by the World Bank (2020b). Nonetheless, political instability in the country, which has become an acute macroeconomic disease of Nepal has been seen as the main accuse of harming the domestic private investment.

VI. CONCLUDING REMARKS

This paper has assessed the contribution of remittances on economic growth and domestic private investment of Nepal by employing the ARDL bounds test approach. The empirical findings show a positive long-run effect of remittances on GDP and a negative long-run effect of it on domestic private investment. The positive contribution of remittances on GDP oozes out from larger domestic consumptions which on the other hand, has affected the domestic private investment of Nepal negatively. The use of remittances for domestic private investment depends upon the institutional quality and the level of financial development at macrolevel and the purpose for migration at household level. In the current scenario of Nepal, extreme

[12] According to the survey undertaken by NRB (2016), agriculture and foreign employment are the main sources of family's income for over 83 percent of the surveyed households. In addition, 44 percent of the foreign employment workers have had less than 10 years of schooling while 3 percent are illiterate; 73 percent of them are married with at least one child; and 84 percent have had their destinations to either gulf countries or Malaysia. Thus, the majority of the foreign employment workers belong to the marginalised families of the Nepalese society. Therefore, the daily consumption of remittances is basically the need of the recipient families back in Nepal and the remitters are supporting their families altruistically.

use of remittances for consumptions, weak and unstable financial background of the recipient households and prevalence of dependency syndrome together constrain remittances not to act as a source of capital flow for economic growth. The paper concludes that remittances to Nepal behave as compensatory transfers to the recipient households. That is why, remittances increase when there are external shocks to the Nepalese economy.

In light of socio-economic and education background of majority migrant workers' households, the policymakers shall not expect the recipients to get engaged into entrepreneurial activities by themselves. They need rigorous advisory, and training supports in order to have a minimum level of confidence and skills for undertaking any physical and (or) financial investment related decisions. This will require a remittance-focused policy in action. Occasional issuance of the 'Foreign Employment Saving Bonds (FESB)' by Nepal Rastra Bank is an appreciable initiative for reallocating remittances towards productive use; however, low sales percent of it (about 5 percent on average) is really a matter of concern and requires Nepal Rastra Bank to identify the hinderances in due time. The finding also indicates that the fraction of remittances deposited in the banking system do not create positive effect on GDP. Therefore, a remittance-focused policy to reach out the remittance recipients and get them engaged in the rigorous advisory and training supports is necessary to align their income in productive activities such as self-employment, financial investment among others. In comparison to remittances, the contribution of gross fixed capital formation on GDP is significantly larger. However, political stability is the necessary condition for gross fixed capital formation to play its influential role in GDP of Nepal.

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APPENDICES

Appendix A: Results of breakpoint unit root test, Perron's (1997) Innovation Outlier model

Variable series	Type	Level			First Difference			I(p)	Remarks
		TB	k	ADF stat.	TB	k	ADF stat.		
lnGDPr	IO2	2015	4	-9.1764***	-	-	-	I(0)	Intercept break, trend break, and dummy break were found significant within 1 percent level.
lnRMr	IO1	2017	0	-3.3643	2005	0	-5.6104***	I(1)	Intercept break was found significant within 10 percent level.
lnGFCFr	IO1	2017	3	-6.2963***	-	-	-	I(0)	Intercept break was found significant within 1 percent level.
lnXr	IO2	2013	1	-6.1451***	-	-	-	I(0)	Intercept break was found significant within 1 percent level. Trend break was found significant within 10 percent level.
lnRMr*$\frac{D}{GDP}$	IO1	2015	4	-4.6540*	2016	2	-6.3107***	I(1)	Intercept break and break dummy are found significant within 1 percent level.
$\frac{P\_GFCF}{GDP}$	IO1	2015	4	-5.2843**	2019	0	-5.6516***	I(1)	Intercept break, and break dummy were not found significant within 5 percent level in the level form. They became significant in the first difference within 5 percent level.
$\frac{RM}{GDP}$	IO1	2017	0	-2.7593	2016	1	-5.6493***	I(1)	Intercept break and break dummy are found significant within 5 percent level.
$\frac{GDS}{GDP}$	IO2	2015	4	-5.8915***	-	-	-	I(0)	Trend, intercept break, trend break, and break dummy all are found significant within 1 percent level.
$\frac{D}{GDP}$	IO1	2014	4	-5.4944***	-	-	-	I(0)	Intercept break was found significant within 1 percent level.

Source: Author's estimates.

Appendix B: Variables' series used in data analysis

FY	GDPc	GDSc	RM	GFCF	P_GFCF	Gross Exports	Gross Deposits	POL INDEX	GDP Deflator	$\frac{RM}{GDP}$	$\frac{D}{GDP}$	$\frac{GDS}{GDP}$
2000/01	441,519	51,501	47,216	84,751	66,687	99,610	181,203	-1.17	100	10.7	41.0	11.7
2001/02	459,443	43,599	47,536	89,889	72,450	81,492	183,728	-1.44*	104	10.3	40.0	9.5
2002/03	492,231	42,141	54,203	98,073	83,354	77,280	202,734	-1.72	107	11.0	41.2	8.6
2003/04	536,749	63,064	58,588	109,181	94,226	89,544	232,576	-1.89	111	10.9	43.3	11.7
2004/05	589,412	68,110	65,541	117,539	100,326	85,958	250,465	-2.15	118	11.1	42.5	11.6
2005/06	654,084	58,757	97,689	135,532	118,023	87,952	289,976	-2.10	126	14.9	44.3	9.0
2006/07	727,827	71,453	100,145	153,337	128,692	93,567	334,453	-1.89	135	13.8	46.0	9.8
2007/08	815,658	80,188	142,683	178,446	145,453	104,207	421,524	-1.88	143	17.5	51.7	9.8
2008/09	988,272	93,230	209,699	211,039	166,761	122,737	550,677	-1.83	166	21.2	55.7	9.4
2009/10	1,192,774	136,589	231,725	264,888	211,223	114,298	620,609	-1.62	190	19.4	52.0	11.5
2010/11	1,374,953	190,924	253,552	292,730	228,924	121,714	823,235	-1.58	212	18.4	59.9	13.9
2011/12	1,536,000	167,805	359,554	317,185	235,829	153,863	1,011,823	-1.42	226	23.4	65.9	10.9
2012/13	1,695,011	178,882	434,582	382,972	307,586	181,180	1,188,090	-1.38	238	25.6	70.1	10.6
2013/14	1,964,540	234,227	543,294	462,013	367,034	226,022	1,406,770	-1.13	259	27.7	71.6	11.9
2014/15	2,130,150	196,103	617,279	595,823	485,568	247,565	1,688,830	-0.72	272	29.0	79.3	9.2
2015/16	2,253,163	91,644	665,064	647,294	486,792	213,338	2,016,816	-1.00	286	29.5	89.5	4.1
2016/17	2,674,493	359,206	695,452	840,693	671,150	240,392	2,299,808	-0.85	312	26.0	86.0	13.4
2017/18	3,044,927	506,418	755,059	1,051,957	790,450	270,105	2,742,103	-0.69	331	24.8	90.1	16.6
2018/19	3,458,793	656,235	879,271	1,164,939	928,579	300,222	3,235,067	-0.60	344	25.4	93.5	19.0
2019/20	3,767,043	681,971	875,027	1,059,966	825,624	264,367	3,839,727	-0.47	369	23.2	101.9	18.1

c = at current price values, * Since the POLINDEX value was missing for year 2001, it has been estimated by averaging the preceding and succeeding indices.

Source: CBS (2021), NRB (2021), World Bank (2020a), and author's estimates.