Empirical Analysis of Remittance Inflow: The Case of Nepal

Karan Singh THAGUNNA
School of Management, Kathmandu University, Lalitpur, Nepal.
P.O.BOX: 6250 Pinchhe Tole, Balkumari, Lalitpur.
Tel: +977-1-5548891; Fax: +977-1-5533814
Email: karan@kusom.edu.np

Saujanya ACHARYA
Kathmandu University, Lalitpur, Nepal. Student at the School of Management
Tel: +977-9801-077-420. Email: 10726_saujanya@kusom.edu.np

ABSTRACT: This paper analyzes the nine year remittance inflow and macroeconomic data of Nepal, and studies the effect of remittance on each of those macroeconomic variables. We have used Unit Root Test, Least Squared Regression Analysis, and Granger Causality Test. The empirical results suggest that remittance has more causality on the consumption pattern as well as the import patter, and less on investments. Furthermore, with available literatures, this paper discusses the importance of channeling the remittance funds into the productive capital, mainly the public infrastructure, in comparison with the South Korean case study.

Keywords: Remittance; Growth; Unit Root Test; Granger Causality Test; Cobb-Douglas Function; Two Gap Model; Nepal
JEL Classifications: E13; E22; F24; O40

1. Introduction

In the past two decades, increasing number of Nepali people has been migrating abroad in the pursuit of better opportunities. Definitely, a decade long Maoist's insurgency in Nepal (1996 – 2006) compelled for the massive exodus. Rather than living under uncertainties and life threatening risks associated with the civil war, thousands of people opted for emigration – whether as laborers, students or as other status of residency. With the 2005 figure alone, it is estimated that 4.77% of the Nepali population are emigrants – and there is an upward pressure on the figure. Remittance is the money sent back home by the workers who have migrated abroad. It would include cash or non-cash items, and could arrive in the country through a formal or informal channel.

In the recent years, there has been an increasing demand for the Nepali workers in - international labor markets, and hence, the amount of remittance flow into the Nepali economy has been on an upward trend – in fact, it has been so for the past 10 years. Essentially, our economy has grown depended on remittance over the past decade.

In the fiscal year 2010/11, Rs. 259.53 billion was reported to have arrived in a 10 months period; in the year 2009/10, inflow of Rs. 231.73 billion was reported (Nepal Rastra Bank, 2011). In fact, as of 2010, remittance accounts for 23 %[1] of the GDP. And Nepal is within top five countries in the world with highest remittance-GDP ratio.

As shown in the Figure 1, remittance seems to have a pulled up favorable balance of payment for the most part of the decade. With its contribution, as well as the foreign aid inflow, balance of payment surplus of Rs. 1 billion in the year 2010/11 was reported, despite the deficit faced in the year 2009/10 (Nepal Rastra Bank, 2011).

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[1] This figure is subject to debate, as significant amount is arriving through the informal channel is not considered.

Table 1. Remittance inflow to Nepal (FY: 2001/02 – 2009/10)

| Financial Year	Remittance Inflow (In Rs. Billion)
2001/02	47.22
2002/03	47.54
2003/04	54.2
2004/05	58.59
2005/06	65.54
2006/07	97.69
2007/08	142.68
2008/09	209.7
2009/10	231.73

Source: Ministry of Finance, Government of Nepal (2011)

Figure 1. Remittance – Balance of Payment (FY2001/02 – 2009/10
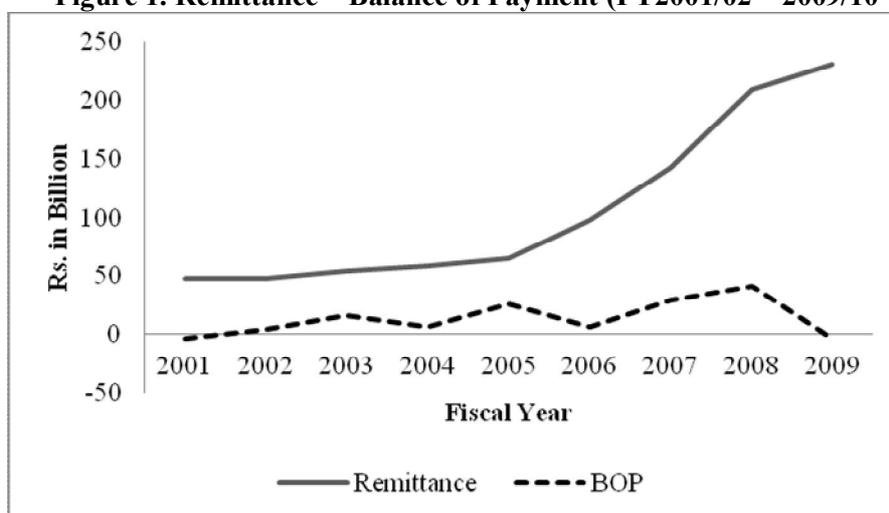
Source: Ministry of Finance, Government of Nepal (2010)

**Figure 2. Remittance – Export – Import Trend (FY 2001/02 – 2009/10)**
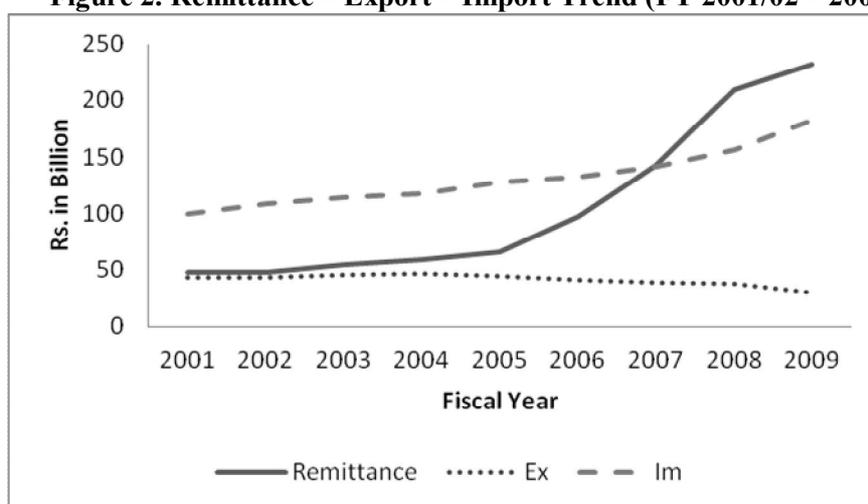
Source: Ministry of Finance, Government of Nepal (2010)

As shown in Figure 2, during the ten year period that experienced mass inflow of remittance, Nepali export declined, where as the import increased. It can be derived that the remittance has not been utilized in productive sectors to achieve better international competitiveness. Instead, imports

grew in tandem with the remittance inflow. To a large extent the so-called phenomenon of "Dutch Diseases" might be in play as the influx of foreign currency in the form of remittance appreciates local currency (or at least stop depreciation). In addition, there is also seemingly negative impact on labor market due to shortage of labor forces and high wage rate. As a result Nepali economy relies on remittance inflow for the stabilization of the balance of payment, which has been favorable over the years, as shown in Figure 1.

Figure 3. Current effect of Remittance inflow on Nepali Economy
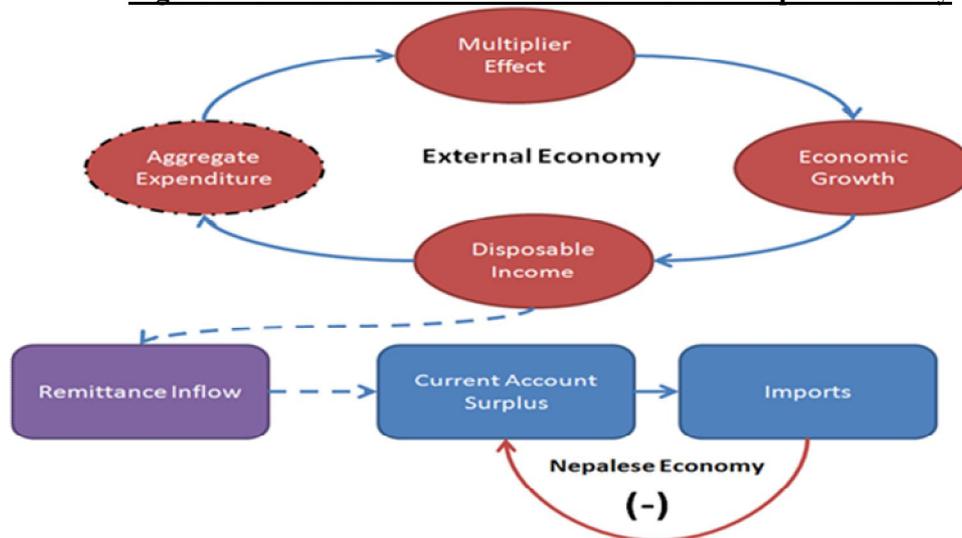
As shown in the Figure 3, remittance acts as a stabilizing factor in maintaining a favorable balance of payment – as remittance significantly accounted for the current account surplus in the recent years (Nepal Rastra Bank, 2011). Remittance is not acting as a source of stimulus that drives toward higher economic output through investment; instead, inflow of remittance is integral in maintaining favorable balance of payment, thereby allowing the desired level of consumption.

Aggregate expenditure of the external economy, as shown in Figure 3, is subject to many macro-economic factors including, but is not limited to, consumer confidence, oil price, economic policy, or even climate. Essentially, our economy is betting its own economic performance to the multivariate factors that could influence the performance of the outside economy – i.e. economy of countries that we are exporting labors to. When the economic crisis occurs in the outside economies, then the amount of remittance flowing into Nepal would decrease as the unemployment rate would be rising in the economies in recession. As most Nepali migrates as a blue collar labors, the recession would have more effect, as more number of blue collar jobs get cut. In such scenarios, Nepali economy would not be able to maintain the similar level of balance of payment as before. In addition, since significant portion of GDP is accounted for remittance, it is likely that Nepali economy would suffer economic downturn as well. Hence, in the long run, current dependency on remittance could trigger structural problems.

1.1 Korean Case Study

Compared to the South Korea in the 1960s, when the South Korean development began, Nepal currently stands in a better macro-economic position. In order to achieve economic growth, President Park Jung-hee's aids formed the first 5-year economic development plan, which composed of plan to develop several industries in South Korea such as the chemical industry, steel industry, heavy industry and others. In all, the ministers, generals, and the experts at that time, all sat with the president and discussed the area of investment that the South Korean government needed to invest in (Chol, 2009).

Although there were foreign aids and loans, mainly from the United States, flowing into South Korea, much of it were used in consumption and the amount was decreasing as the time went by. And during the early days, foreign direct investments were not arriving into South Korea, as risk of war was still associated. By 1963, Korea had foreign exchange reserves below $100 million, which put the country in the brink of bankruptcy (Chol, 2009).

During this time, apart from the foreign aid, many South Korean youth, due to persistent unemployment, sought employment abroad, mainly in the Middle East, and Turkey. Where South Koreans worked as miners or as nurses, even most of them worked overtime. The money sent back home by them eventually contributed, despite the small scale it alleviate the foreign reserve constraints.

Over the decade, in the 1970s, South Korean economy was booming with around 8% average annual GDP growth (Ro, 2002). However, in case of Nepal, from the year 2001 - similar GDP to the South Korea in the early 70s – till today, the economy has been expanding at 3.5% average, which is significantly less in comparison to the South Koreans. Evidently, South Korean government invested significantly more than what Nepali government invested. Surely, the political instability in Nepal has hindered the economic growth; yet, Nepal is in a better foreign reserve condition than South Korea in the late 1960s and early 1970s. Remittance inflow is providing opportunities for sustainable growth.

1.2. Objectives

This paper has dual objectives: first to empirically and theoretically investigate the impact of remittance of several macroeconomic variables through Granger Causality Test Method. Second, the study would establish the importance of remittance in its role of triggering a kick start to the Nepali economy. It would evaluate the importance of remittance to be channeled toward infrastructure investment.

1.3 Literature Review

With the increased emigration of Nepali workers over the past one decade, remittance inflow is a phenomenon that has been receiving attention in the Nepali macroeconomic environment. Apart from eradicating poverty in the Nepali rural areas, remittance inflow has also maintained the balance of payment situation. In addition, Chenery and Strout's (1966) two-gap model shows the importance of remittance inflow in decreasing the foreign exchange gap. In all, the remittance inflow has been a key to the Nepali macroeconomic stability.

Capital inflow from the external economy provides a great buffer to the economy. It stimulates the economy, and when invested, also leads to the employment generation (Salman, 2011). However, academics have raised concern on the importance of as well as methods of channelizing those funds for productive investment purposes (Pant, 2011). Numerous studies, (Salman 2011) as well as (Samimi et al., 2010), have empirically analyzed the impact of the foreign capital flow into their respective economies.

Relating the remittance inflow to the Nepali economic development, scope is significant in the infrastructure sector. In (Aschauer, 1988), the importance of infrastructure investment is highlighted, and non-military investment by the government has an integral contribution to the economic growth and productivity improvement. Then (Acharya, 2003) discusses the link between infrastructure development and socio-economic development.It also highlights the current trend of external financing through Official Development Assistance (ODA), which brings our discussion of remittance being the potential mode of financing.

2. Data, Methods and Results

2.1. Model Framework and Data Sources

The variables that would be studied mainly relates to macroeconomic variables affecting the Gross Domestic Product (GDP) of Nepal. In this study, the identified variables are consumption (CN), investments (I), savings (S), import (IM) and export (EX). First, with the analysis of Durban-Watson Statistics, Akaike Information Criterion and Schwarz Criterion, the regression equation is established. Then the Granger Causality Test for remittance inflow and each of the aforementioned variables has been conducted.

The model is based on the data within the time series of Nepali Fiscal Year 2001/02 – 2009/10. Data on each variable are obtained from *Economic Survey: Fiscal Year 2010/2011* published by *Ministry of Finance, Government of Nepal.* All the data are represented in Rs. billion. In addition, logarithmic transformation was conducted on the data.

2.2. Unit Root Test

Before moving on to regression, Unit Root Test of each variables was conducted in order to test whether the data are stationary or not. Stationarity is important for both least square regression as well as the Granger Causality Test in order to avoid misleading parameter estimates of relationship between variables.

The Unit Root Test was conducted with the following hypothesis:

H_0: The concerned variable has a unit root

H_1: The concerned variable does not have a unit root.

Following table summarizes the decision at the 5% significance level.

Table 2. Unit Root Test decision

Variable	GDP	Consumption	Investment	Savings	Export	Import
Decision	Accept	Accept	Accept	**Reject**	Accept	Accept

Referring to Table 2, the test provides enough evidence to reject the null hypothesis for the case of savings, which does not have a unit root, which is differenced at 1st level (all others were had the lag length of 0).

2.3. Least Squared Regression Analysis

The original model in this case would be the following, where β represents the coefficient, and μ represents the error:

$$gdp = \beta_0 + \beta_1 CN + \beta_2 I + \beta_3 S + \beta_4 IM + \beta_5 EX + \mu \qquad (1)$$

Following is the regression result using E views.

Table 3. Regression Results

Dependent Variable: GDP
Method: Least Squares
Date: 03/27/12   Time: 15:20
Sample: 2001 2009
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CN	0.836567	0.019627	42.62323	0.0000
I	0.008352	0.013212	0.632103	0.5722
S	0.095320	0.005236	18.20470	0.0004
IM	0.021558	0.016611	1.297797	0.2851
EX	-0.009296	0.006177	-1.504986	0.2294
C	0.268695	0.053164	5.054076	0.0149

R-squared	0.999979	Mean dependent var	2.684381
Adjusted R-squared	0.999945	S.D. dependent var	0.043281
S.E. of regression	0.000322	Akaike info criterion	-13.00809
Sum squared resid	3.11E-07	Schwarz criterion	-12.87661
Log likelihood	64.53641	F-statistic	28871.42
Durbin-Watson stat	2.207738	Prob(F-statistic)	0.000000

From the regression results above, it can be concluded that consumption has the significant contribution to the Nepali economy at the present. After consumption, most contribution comes from savings and investment, both with a positive coefficient. And finally, the outcome of the coefficients of import and export is quite unorthodox, as the import has positive coefficient and export has a positive coefficient.

2.4. Granger Causality Test

Essentially, this study is conducted in order to empirically determine the effect of remittance on the macroeconomic variables. In the previous sections, using the regression, it was made possible to understand the correlation among some of the macroeconomic variables with the dependent variable GDP. Granger Causality Test is a method of determining the causal relationship between two variables at a time. Using the statistical analysis software E Views, Granger Causality Test was conducted for remittance and each of the aforementioned macroeconomic variables. Following table summarizes the test results.

Table 4. Granger Causality Test Result

Null Hypothesis	Obs.	F-Statistic	p - value
Consumption does not Granger cause Remittance	7	6.94152	0.12592
Remittance does not Granger cause Consumption		0.04942	0.95291
Investment does not Granger cause Remittance	7	1.65654	0.37643
Remittance does not Granger cause Investment		5.42921	0.15554
Savings does not Granger cause Remittance	7	2.52416	0.28376
Remittance does not Granger cause Savings		0.61692	0.61846
Import does not Granger cause Remittance	7	1.45230	0.40778
Remittance does not Granger cause Import		6.80554	0.12811
Export does not Granger cause Remittance	7	5.12597	0.16324
Remittance does not Granger cause Export		2.77532	0.26488

As none of the null hypothesis is significant up to 10% significance level, this case would hold 15%[2] as it's α level. When α = 0.15, we can reject the hypothesis "Consumption does not Granger cause Remittance" and "Remittance does not Granger cause Import."

3. Discussion

3.1. Consumption and Imports

In the regression results in the section 2.3., consumption stood out to be one of the major determinants of the GDP, as the coefficient of the consumption is positive and is higher compared to other factors. In case of the imports, the coefficient happens to be positive. In addition, the Granger Causality Test result indicates that, at the 15% significance level, the null hypothesis "consumption does not Granger cause Remittance" and "remittance does not Granger cause Import" are both significant. Hence, we can reject those null hypotheses.

Essentially, remittance is the major contributing factor that allows our economy to opt out of the unfavorable balance of payment that we would have otherwise faced due to increasing trade deficit every year. As household has increased on their consumption, also of imported products, the investment has not increased in tandem. Hence, since our economy is consuming more than it can afford, dependency on remittance has also grown. In a way, consumption does cause remittance inflow, as the economy is depended on it to off-set the current account deficit.

3.2. Savings and Investment

From the section 2.3 Least Squared Regression Analysis, it has been observed that the consumption has significant impact on the overall GDP of Nepali economy. Savings and investment do have positive coefficient, indicating the direct effect on the GDP. However, the degree at which that impact takes place is not high, especially not enough for the developing countries like Nepal. For least developed countries (LDCs) like Nepal, there needs to be more investment in physical public capital such as the transport infrastructures than demanded by the public (Acharya, 2003).

Regression analysis determined the contribution of savings and investment to the overall economic output, or the GDP. Next, from the Granger Causality Test results in Table 4, there were no statistical significance to reject the null hypothesis of both "remittance does not Granger cause investment" and "remittance does not Granger cause savings." Essentially, this indicates that no causality existed between remittance and investment or savings.

One of the similar characteristics of the developing countries around the world is lack of infrastructures. In the past, form of foreign aid known as Official Development Assistance (ODA) played an important role in providing sufficient funds – eliminating both saving gap and mainly the foreign exchange gap constraints (Acharya, 2003). However, it seems that much of ODA nowadays are targeted more toward developing soft infrastructures that would have more direct impact on poverty alleviation than investment toward hard infrastructure, which is considered to be "simply a waste of resource" (Easterly 2001). In addition, the ODA led infrastructure development projects tend to be several time costlier than it would have been if it was funded by local resources, as the

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[2] Any null hypothesis that are significant, or has the *p*-value of less than 0.15, will be rejected.

prerequisites to aid asks for hiring of international consultants (Acharya 2003). Hence, Nepali policy makers would now need to think beyond ODA as a source of hard infrastructure development: which answer seems to lie within effective channeling of the remittance funds.

Figure 4. Remittance – Foreign Reserves Trend (FY: 2001/02 – 2009/10)
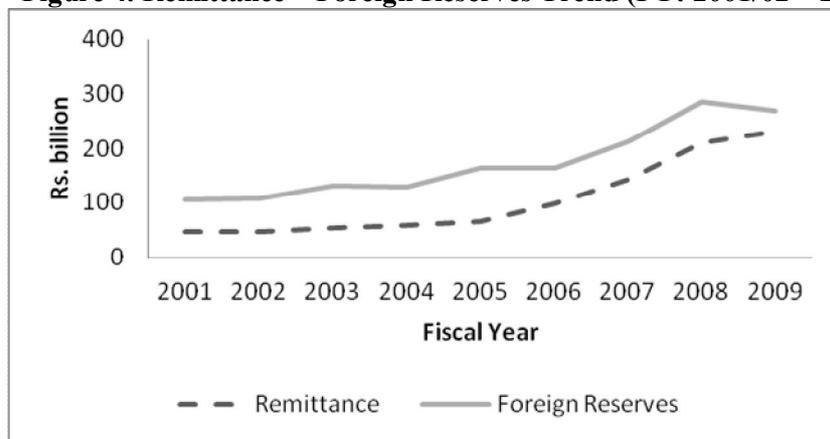

Source: Ministry of Finance, Government of Nepal (2010)

In case of Nepal, due to increasing remittance inflow, foreign reserves have been increasing in tandem. This will ease the foreign exchange constraints, and it is less likely that Nepal would be facing binding constraints when implementing infrastructure development projects.

4. Conclusion for Nepal

With more investment in infrastructure and other productive sectors, the economy would generate its own economic return, making the domestic market stronger and entrepreneurship to improve. Such economic return would create more opportunities and incentives for future investment – creating a virtuous cycle. Greater economic return would have negative causality on migration, as opportunities within Nepal would provide incentives for people to stay. Gradually, the economy would emerge out of its remittance dependency. This essentially, would establish Nepali economy to be self confident and competitive. Numerous policy measures recommended in (Pant, 2011) could be utilized to capture the remittance fund, and utilize it in investment for more productive sectors.

Figure 5. Feedback on flight from remittance dependency
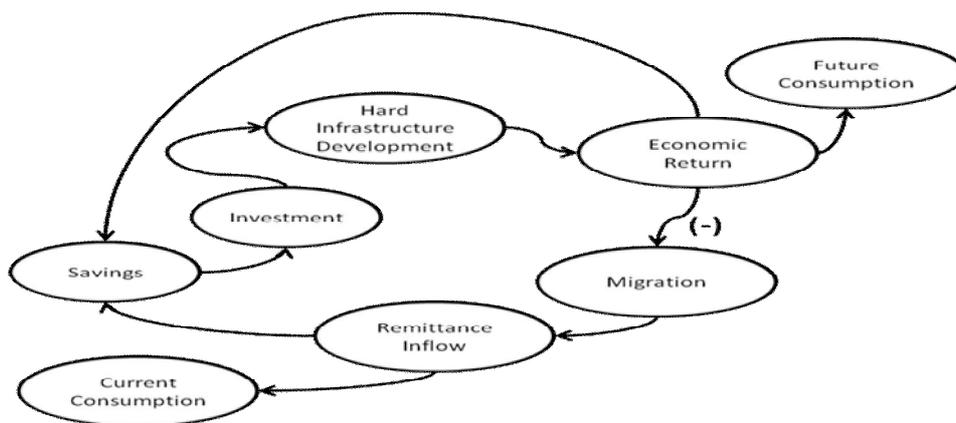
5. Conclusions and Further Implications

Nepali economic growth, due to higher Remittance is essentially a "pseudo-growth". The economy is able to afford foreign imports not because of the return from its economic output – through higher level of exports of goods and services – but it is simply from the return of exporting labors. When remittance from official source alone is approximately the quarter of the GDP, there is a significant risk.

For a developing country, infrastructure investment is essential. Public infrastructures such as highways, railways, ports and airports all provide positive economic impact. And as argued in (Acharya, 2003), developing countries should have higher supply of public infrastructures than demanded. Such would stimulate further economic activities to take place, which would trigger the virtuous cycle of economic growth. South Korean government under the direction of President Park Jung-hee heavily invested on infrastructure development. This had later contributed the significant factor in South Korea emerging as the major economy of Asia.

South Korea faced significant foreign exchange constraint when implementing their economic plans, particularly infrastructure development. However, they were able to offset such problems through series of international loans, aids and remittance inflow. With infrastructure development, economic activities in South Korea flourished. Hence, South Koreans were able to generate funds internally for further development, as well as their trade deficit was reduced. Essentially, South Korean grew out of foreign funds dependency, and grew self sufficient.

With most donor agencies fund and ODA allocated more toward developing "soft infrastructures" (Acharya, 2003), countries would be required to allocate more of their resources for "hard infrastructure" development. While remittance inflow is still significant to the Nepali economy, our policy should be to channelize those funds to infrastructure development.

As of now, remittance inflow is simply short-circuited to financing import for consumption. The economic stimulus is not great. Yet, when "harnessed" into the productive sector, there is good scope of kick-starting economy with stronger stimulation effect. This asks for a strong implementation of policies that would shift Nepali economy away from its remittance dependency in the future.

References

Acharya, S.R. (2003). "Official Development Assistance (ODA) in Transport Sector: Challenges and Opportunities". *Eastern Asia Society for Transportation Studies,* 4, 1572-1586.

Aschauer, D.A. (1989). "Is Public Expenditure Productive." *Journal of Monetary Economics*, 23, 177-200.

Chenery, H.B., Strout, A.M. (1966)."Foreign Assistance and Economic Development". *The American Economic Review,* 90, 847-868.

Chol, O.W. (2009). The Korea Story- President Park Jung-hee's leadership and the Korean industrial revolution: Wisdom Tree. ISBN: 9788996071549.

Easterly, W. (2001). The Elusive Quest of Growth. Cambridge: The MIT Press. ISBN: 9780262550420.

Nepal Rastra Bank (2012). Monetary Policy for Fiscal Year 2011/12. Central Bank Report. Kathmandu: NRB.

Nepal Rastra Bank (2011). Monetary Policy for Fiscal Year 2010/11. Central Bank Report. Kathmandu: NRB.

Pant, B. (2011). "Harnessing Remittances for Productive Use in Nepal". Nepal Rastra Bank Economic Review. No. 23, pp.1-20.

Ro, J. (2002). "Infrastructure Development in Korea." Infrastructure Development in Pacific Region, Osaka, Japan.

Salman, A. (2011). "Empirical Analysis of Private Investment." *IPEDR.*, 10, 546-550.

Samimi, A.J, Zeinab, R., Faezeh, A.(2010). "Growth and FDI in OIC Countries." *Australian Journal of Basic and Applied Sciences*. 4, 4883-4885.