

IMPACT OF REMITTANCES ON ECONOMIC GROWTH: AN EMPIRICAL STUDY OF 14 DEVELOPING COUNTRIES

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ABSTRACT

Personal remittance provides a significant source of foreign currency to developing countries to catering their need of foreign currency not only for the purpose of current consumption but also contributes significantly to the economy's development process. For many of the countries, remittance is the larger source for foreign currency than foreign direct Investment (FDI) for their developing needs. The purpose of my study to addresses the heated debate about role of remittance in economic development of developing countries with using appropriate control variables.

The primary aim of this study is to analyse the impact of remittances in development of 14 selected developing countries, for this analysis it has chosen a different variable panel data set for various economic parameters of 14 developing countries for 20 years i.e. for period from 1997 to 2016. The choice of the 14 countries has been made as they happen to be ones that receive highest quantum of remittances as proportion to their GDP in the category of developing countries.

Secondarily, the study uses an econometric model using panel data. The study finds that the remittances do play a significant and positive role in the process of development of developing countries.

Introduction

Remittances have become a new source of foreign exchange for many receiving economies and a source for sustainable income source for households in across the space of the country. In the case of India, which is the largest remittance receiving country in world, remittances play a very important role in demand generation especially in rural parts of the developing and source of employment. According to the World Bank (2014), the total remittance was \$430 billion and it

was 0.31% of world GDP in 2009. The significance of remittance in economic system is higher in case of developing countries because they receive \$307.1 billion out of total of \$430 billion dollar, which about 74 percent or 27% of GDP of developing countries. Remittance flow to developing countries was \$414 billion in 2014 which was second largest source of external finance after foreign direct investment.

Increase in remittance flow to developing countries can see explain by two factors; one is overall increase in total immigration for developing countries to developed countries and second, reduction in transportation cost for transferring money from one country to other. Remittance is more important as compare to other external source of finance, because of its stable nature as compare to other source like FDI, foreign loan and Aid.

Recorded remittances are more than twice as large as official aid and nearly two-thirds of foreign direct investment (FDI) flows to developing countries. The enormous upward movement in remittances payments may be attributed largely to two factors, namely; immigration between developing and developed countries has increased dramatically in the past 20 years and decline in transaction costs as technological improvements have allowed for faster, lower cost mechanisms for the international transfer of payments between individuals. Remittance is different from other external capital inflow like foreign direct investment, foreign loans and aids due to its stable nature.

The purpose of this paper is to examine whether remittances has a positive or negative effect in the growth of GDP per capita in the developing countries. By using empirical method in fourteen developing countries from different regions of the world, the region with countries of high receiving ratio in remittances to GDP, the impact of remittances is to be observed.

Empirical Literature review

There are many studies by researchers to know that economic and behavioural impact of remittances. There are studies show there is positive contribution of remittance to remittance receiving country but some shows other way. Specifically, studies on Pakistan, Morocco, India and Mediterranean countries show a positive impact on countries investment.

Study by Adams and Page, Acosta et al. and World Bank showed that remittance by immigrant workers impact receiver countries balance of payments account positively in many developing countries as well as contribute economics development, via direct impact of remittance on saving and investment in human capital and physical capital and, indirect impact through boost in consumption.

Ratha (2003), in her study, concludes that remittances increase the consumption level of rural households, which might have substantial multiplier effects, because they are more likely to be spent on domestically produced goods.

Giuliano and Ruiz-Arranz had worked on data set of more than 100 developing countries from years 1975–2002 and found that remittances can enhance economic growth only in less financially developed countries.

The positive developmental effects of remittances focus on the multiplier effects of consumption, development of the financial institutions that handle remittance payments, use of remittances as foreign exchange, and the role of remittances as an alternative to debt that helps alleviate individuals credit constraints in countries where micro-financing is not widely available. From above studies we can say positive developmental effects of remittances focuses on the multiplier effects of consumption, development of the financial institutions that handle remittance payments, use of remittances as foreign exchange, and the role of remittances as an alternative to debt that helps alleviate individuals credit constraints in countries where micro-financing is not widely available

Even there is large number of studies which show positive impact of remittance but in literature there is some studies which shows negative impact of remittance in development of remittance receiving country.

Another study by Amuedo-Dorantes&Pozo and López et al. concluded that remittances, like capital flows can appreciate the real exchange rate in recipient economies and therefore generate a resource allocation from the tradable to the non-tradable sector. Rodrik, in his study provided evidence that real exchange rate overvaluation undermines long-term economic growth, particularly for developing countries, in that in those countries tradable goods production suffers disproportionately from weak institutions and market failures.

Chaim and Jahjah found that migrant's remittances have negative impact on growth in per capita incomes. The study reported three stylized facts: first, that a "significant proportion, and often the majority," of remittances are spent on consumption; secondly, that a smaller part of remittance funds goes into saving or investment; and thirdly, the ways in which remittances are typically saved or invested – in housing, land and jewellery – are "not necessarily productive" to the economy as a whole. Empirical results also indicate that remittances may indirectly affect real exchange rate leading to the "Dutch Disease" phenomenon, where remittances inflow causes a real appreciation, or postpones depreciation, of the exchange rate. Exchange rates appreciate in countries with large remittances which will in turn hurt the economic growth.

Nevertheless, Barajas et al. pointed out that the more highly integrated an economy is with world financial markets, and the more highly developed the domestic financial system, the less likely it is that remittance receipts will stimulate investment by relaxing credit constraints. Using, estimated dynamic simultaneous Keynesian type model for investigating the impact of remittances on consumption, investment, imports and output for eight countries including Algeria, Egypt, Greece, Jordan, Morocco, Portugal, Syria and Tunisia for the period of 1969–1993 and then further extended in the other study that is, 1969–1998, Glytsos findings for both studies pointed out that the effect of remittances on growth is partial and in several years negative impact of remittances to growth is observed.

In concluding above studies, we can say in short that there is negative and positive impact of remittance, and there is one more important aspect about which is so-called “*brain drain*”, remittance receiving country receive foreign exchange which help in boost domestic goods demand and investment but on the other hand it loses its best talent which can help in dynamic process of growth. In case of developing countries, they use to be short of skilled manpower but due to emigration this problem become more sever so it can affect in both ways.

Data and Methodology

To analyse the impact of remittances on economic growth of developing countries, the study has used panel data for 14 developing countries for period of 20 years i.e. from 1997-2016. The data is aggregated from ‘world development indicator’ report by world bank (2018). The study considers Foreign direct investment, net inflows (% of GDP), which are defined as the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP. Other variable of interest is trade which is defined as total export and import of goods and services as percentage of GDP. Additionally, the study incorporates population growth annual to increase explanation power of model.

Further, Remittances are measured by the variable Personal remittances, received (% of GDP), which comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers thus include all current transfers between resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities. Data are the sum of two items defined in the sixth

edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employees

Model

To study the role of remittance on economic growth, following panel regression is used. The panel data allow for a deeper exploration of the factors that influence macroeconomic growth based on two additional specifications: fixed-effects and random-effects. The fixed-effects model captures the sources of change within countries, while the random-effects model assumes a random variation across countries and is more appropriate if differences among countries affect the dependent variable. I use 14 Countries for this study they are as follow:

1.Tonga	2. Tajikistan	3. Nepal	4. El Salvador	5.Moldova
6. Honduras	7. Jamaica	8. Armenia	9. Lebanon	10. Comoros
11. Georgia	12.Bosnia and Herzegovina	13.Guatemala	14. Jordan	

Countries numbers are same as in below graphs.

$$g_gdppccont_{it} = \beta_0 + \beta_1 rem_{it} + \beta_2 trade_{it} + \beta_3 fdi_{it} + \beta_5 dummyforcountry + \beta_5 pop_{it} + \beta_6 dum09it + \epsilon_{it}$$

Before using econometric analysis lets defined our variables

g_gdppccont= Growth of GDP per capita (constant2010 US\$)

rem = remittance received by country as percentage GDP

trade = total export plus import as percentage of gdp

fdi= foreign direct investment received by country as percentage of GDP

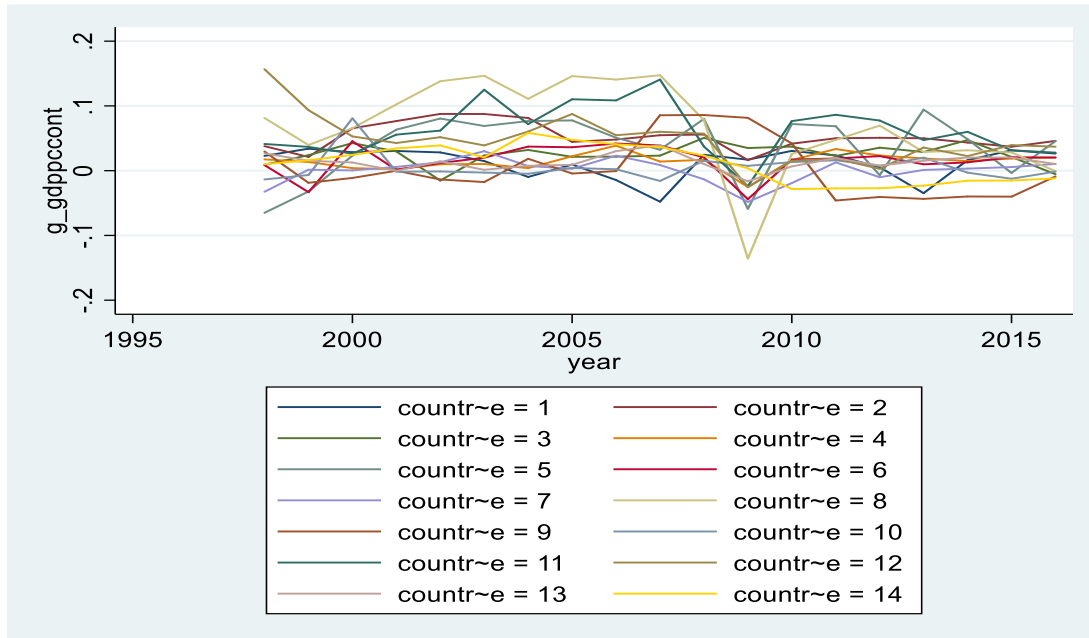
pop = Annual growth of population

dum09 = dummy variable for year 2009

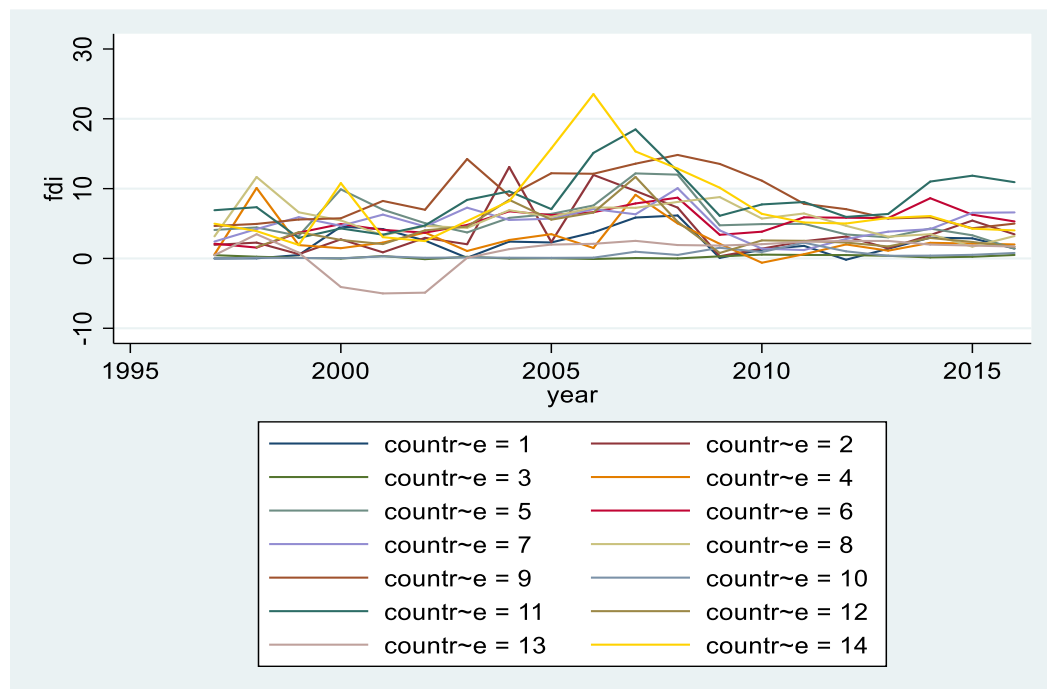
dummyforcountry = dummy for year 2009 for country Armenia.

Data Visualization for selected variables:

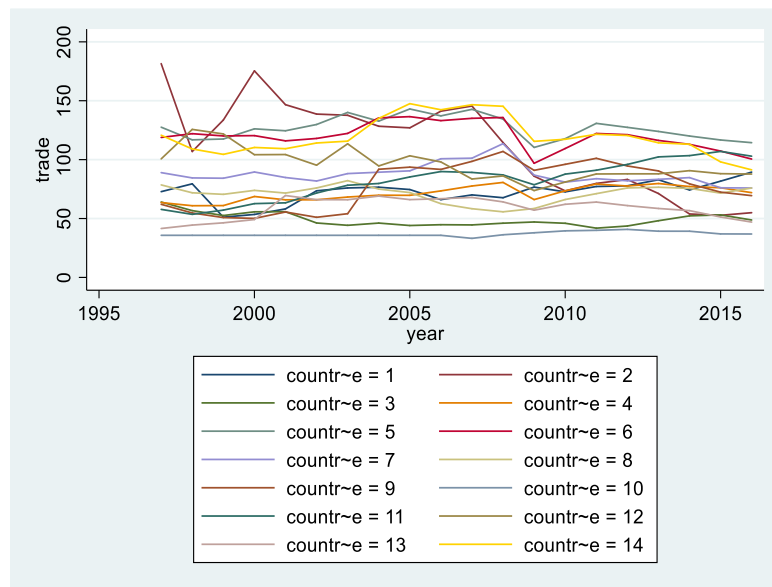
1. g_gdppccont i.e. GDP growth per capita in constant US\$



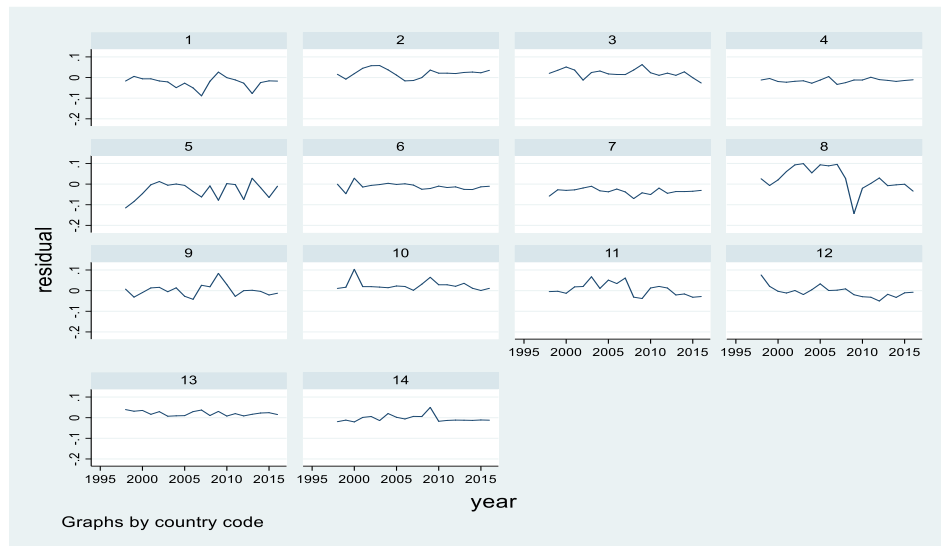
2. Foreign Direct Investment (FDI) as percentage of GDP



3. Trade (export + import of goods and services) as percentage of GDP



Residual Graph:



In above model I used two dummy variables to control outliers effect on main result, justification for using two dummy is as follow, if we see graph for growth of GDP per capita there is sharp fall in GDP per capita growth for all countries because of financial crisis so I controlled for that even and justification for introducing dummy for country can be seen from residual plot, in residual plot graph 8 (Armenia) show a sharp dip so controlled for that also.

Finally, Hausman test will help decide which model - FE or RE - is more appropriate for our dataset. Good data on remittance flows are difficult to obtain. Official statistics capture only a

fraction of the total, as a large part of the remittances goes through informal channels, such as family and friends. Moreover, the concrete destination of these resources cannot be estimated accurately at the macroeconomic level.

Results

The Model presented above, is just the general shape of the equation that we will test. The following two techniques are characteristic of panel data study. Panel data consisting of repeated observations of the same unit, in our case, the regional countries. Observations occur in different time, annual data that we analyse. The observation period is 20years break, from 1997 to 2016. Our 'Panel' is balanced, which means that the period is the same for every state. Panel Study data allows control of variables, which cannot be observed or measured, for example, cultural factors between countries. This type of analysis is also performed to study the variables that change over time, but not from one country to another, as for example, the agreements.

In order to run a regression model, we need to check that our dependent variable should be stationary i.e. A stationary process has the property that the mean, variance and autocorrelation structure do not change over time.

To check stationarity of dependent variable we will run Levin and Lin (1993), instead of ADF test to remove autocorrelation lagged dependent variables. In the 1993 test, they adopt a similar approach to the ADF test for a unit root, where the null hypothesis is that there is a unit root. In effect ADF tests are carried out for each individual in the panel, then adjusted to account for any heteroskedasticity, a pooled t-test is then produced to test the null, which are asymptotically distributed under the normal distribution and Different lags are allowed across different cross sections.

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Levin-Lin-Chu unit-root test for g_gdppccont
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Ho: Panels contain unit roots          Number of panels =    14
Ha: Panels are stationary              Number of periods =   19

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)
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                Statistic      p-value
-----
Unadjusted t      -9.6817
Adjusted t*       -4.9017      0.0000
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From above unit test reject we can see our dependent variable is stationary because we reject the null hypothesis that panels data contain unit roots so can run regression with worry of spurious regression problem.

Random effect model:

Random-effects GLS regression		Number of obs	=	266
Group variable: countrycode		Number of groups	=	14
R-sq:		Obs per group:		
within	= 0.4303	min	=	19
between	= 0.3471	avg	=	19.0
overall	= 0.3617	max	=	19
corr(u_i, X) = 0 (assumed)		Wald chi2(6)	=	183.46
		Prob > chi2	=	0.0000

g_gdppccont	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
rem	.0007312	.0002316	3.16	0.002	.0002774	.0011851
fdi	.0018887	.0005731	3.30	0.001	.0007654	.003012
pop	-.0136832	.0019288	-7.09	0.000	-.0174636	-.0099027
trade	.0003463	.0001022	3.39	0.001	.0001459	.0005466
dummyforcountry	-.1887913	.0275967	-6.84	0.000	-.2428797	-.1347028
dem2009	-.0302376	.0073984	-4.09	0.000	-.0447382	-.015737
_cons	-.0046096	.0105237	-0.44	0.661	-.0252357	.0160165
sigma_u	.01804116					
sigma_e	.02552189					
rho	.3331967	(fraction of variance due to u_i)				

A fixed effect model (FE) to analyse the Panel data considers explanatory variables as non-random. This fact is in contrast with the pattern of ‘random’ effects (RE), which considers as explanatory variables derived from random events. In panel data analysis, the term ‘fixed effects estimator’ (or ‘Within estimator’) is used to identify appraisers’ regression model parameters. A FE model is used to identify the type of impact variables, which change over time. This technique explores the relationship between independent variables and ‘output’ within the same unit (partner country).

Fixed effect model:

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Fixed-effects (within) regression      Number of obs   =      266
Group variable: countrycode          Number of groups =      14

R-sq:                                Obs per group:
  within = 0.4333                      min =          19
  between = 0.3327                     avg  =          19.0
  overall = 0.3456                      max  =          19

corr(u_i, Xb) = -0.5148                F(6, 246)       =      31.34
                                         Prob > F        =      0.0000
    
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g_gdppccont	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rem	.0008286	.0002377	3.49	0.001	.0003604	.0012968
fdi	.0018047	.0005868	3.08	0.002	.0006489	.0029605
pop	-.0151396	.0022475	-6.74	0.000	-.0195664	-.0107128
trade	.0004827	.000115	4.20	0.000	.0002561	.0007093
dummyforcountry	-.1915661	.0273318	-7.01	0.000	-.2454003	-.1377319
dem2009	-.029376	.0073214	-4.01	0.000	-.0437967	-.0149553
_cons	-.0156507	.0105543	-1.48	0.139	-.0364389	.0051376
sigma_u	.0246247					
sigma_e	.02552189					
rho	.48211434	(fraction of variance due to u_i)				

F test that all u_i=0: F(13, 246) = 11.22 Prob > F = 0.0000

Every country has its own individual characteristics that probably can affect the independent variables. When using FE, we assume that the variables are influenced by an individual characteristic and need to check for this. In econometric terms, we talk about the correlation between the error term and independent variables. FE techniques destroy the effect of these characteristics (independent of time) of the independent variables, so we can estimate the net effect of independent variables. Another important hypothesis of the FE model is that these features are individual for each country, so there should not be correlated with characteristics of other countries. Every country is different from the other, so the error term is the constant (which captures the individual characteristics) should not be correlated with the others. So, in substance, FE models are constructed to study the factors of change within an entity (place). One characteristic that does not change with time may not have caused this change because it is constant for each country.

Hausman Test for selecting appropriate model

	Coefficients		(b-B) Difference	sqrt (diag (V_b-V_B)) S.E.
	(b) fe	(B) re		
rem	.0008286	.0007312	.0000974	.0000538
fdi	.0018047	.0018887	-.000084	.0001259
pop	-.0151396	-.0136832	-.0014564	.0011536
trade	.0004827	.0003463	.0001364	.0000528
dummyforco~y	-.1915661	-.1887913	-.0027748	.
dem2009	-.029376	-.0302376	.0008616	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$\chi^2(6) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$
 = 7.26
 Prob>chi2 = 0.2975

Hausman test suggest using Random effect model is more appropriate for our data set

The logic behind the ‘random’ effects model (RE) is based on the assumption that the difference between the units (countries) is casual (random) and uncorrelated with the independent variables included in the model. According to Green the fundamental difference between the fixed effects and the ‘random’ is the link between individual effects and regressors in the model. These effects may be random or correlated with the independent variables. One advantage of the technique is the inclusion of RE independent variables in modelling time. In the FE model, these variables are ‘within’ a constant term. In this study data for all variables is collected from the publications of World Bank data set “World Development Indicators”. Data set covers most recent year’s annual data from 1997–2016. Some studies had been employed multiple regression analysis to investigate the impact of worker remittances on economic growth (Chami et al., 2003).

In the following, the study presents the Random Effects model, it does so because the null hypothesis in the Hausman test statistic is rejected.

The results show that FDI is a significant variable that positively affects the growth of per capita GDP. Additionally, remittances do have a significant positive impact on growth of per capita GDP i.e., a unit increase in remittances lead to .0007 percent increment in GDP per capita at constant prices. Population, as expected has a negative significant effect on the growth of per capita GDP. Lastly, trade has a positive and significant effect on growth of per capita GDP.

Conclusion

Studies show that remittance provide an important source of foreign currency to developing countries, create rural demand and provide liquidity for investment but there is vast literature that shows that remittance can have negative impact on growth of developing countries. In this analysis using 14 developing countries data for a panel data analysis over 20 years. In order to explore the relationship between remittances and economic growth panel regression analysis is utilized. The study shows that there is positive and significant relation between GDP growth and remittance receiving country.

Different diagnostic tests are applied in order to confirm the major assumption of multiple regression analysis like multicollinearity and heteroskedasticity. After employing all these tests multiple regression analysis is conducted which shows that worker remittances are positively and significantly contribute in the economic growth of these countries. So, contribution of worker remittance is the significant and most important in economic growth. But its productive use can help the economy of these countries to maintain and improve the economic growth by investing this money into consumption and investments.

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