

**BRAIN DRAIN AND ECONOMIC GROWTH IN INDIA,  
NEPAL AND PAKISTAN**

*Zahoor Hussain Javed  
Dr. Muhammad Bux Burdey  
Dr. Anjum Parvez*

**ABSTRACT**

*This paper investigates the relationship between the brain drain, remittances, technology (cell phone) and economic growth in India, Nepal and Pakistan for the period 2000-2014. The expected results are based on investment in remittances, GDP per capita, use of cell phone and brain drain of human capital. The insertion of new technology, remittances and market reforms of each country play vital role for economic growth. The use of cell phone has positive effect on economic growth. Nevertheless, the remittances play basic and vital role for the economic growth. The Hausman, random and fixed effects tests are used to determine the association among GDP per capita, use of cell phone, remittances, and brain drain.*

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**Keywords:** GDP Per Capita, Brain Drain, Cell Phone, Panel Data, India, Nepal, Pakistan

**INTRODUCTION**

Now-a-days in global economy the emigration is one of the most important issues. It is reported by the United Nation (2012) that more than 232 million people live outside from their home country. So the international migration has foremost economic, societal, public, ethical, and partisan effects for both the sending and getting states and more than US\$ 400 billion remittances received by developing countries in 2012-2013. The cross-country analysis suggests that the emigration and remittances reduce poverty, increased investment in education, community development, capacity building, health, and improve economic growth in the developing countries. Nevertheless, the emigration is associated with the loss of skills, human capital and stop development and delivery of basic services from sending countries. Moreover, the international emigration from developing countries is source of capital, trade,

investment, knowledge; reduce skill shortages in key sectors of the economy, effect budgetary position of receiving country, and technology transfers.

This theory of international migration suggests that well-educated and talented citizens of the developing countries or less developed countries due to low wages, unemployment and lack of technological upgrading in many of the developing countries pursue their career in foreign lands, mostly, Western Europe and North America, but never return to their countries of origin to contribute to the development of their own countries (Shinn, 2008).

The shortage of labor market is filled by the emigration of workers from sending countries, in return the emigrant workers send remittances from receiving countries to their families and relatives at home, which increase level of exports and put positive influence on balance of payments, movements of capital and current account balance. Notwithstanding the abundant benefits of migration, the literature shows the harmful impact on society, in version of human capital loss, which is compensated by the emigrants who sent remittances to their home country. The mechanism flow of remittances across borders show highly impacts on societal and financial deeds in home country. The foreign direct investment and the remittances are the essential bases of external finance in many states and have significant macroeconomic effect in the economy (Mitra *et.al.*, 2010). This explanation shows that flow of remittances play vital role in the area of economy. In this regard Lucas & Stark, 1985 explored the role of motivations in the mechanism of flow of remittances. These motivations to remit are based on alliance of economic and societal enthusiasms, such as egotism, humanity, speculation and inheritance motives for the transferal of assets among the emigrants and members of the household. However, Dustmann & Mestres (2010) stated behavior of remittances and suggested that the transfer of remittances from receiving country to home is based purely on the form of emigration. In the global economy a power of economy is based righteously on emigrant remittances. The emigrants transfer resources at very low speed, nonetheless this become billions of dollars annually. Therefore the largest international flows of financial resources are represented by quantity of remittances. The different types of workers send remittances from various countries

which play vital role to reduce unemployment and inflation, improve the balance of payments deficit and budget deficit.

The countries which receive remittance from abroad are advised to move towards consumption based tax by which adverse influences on economic growth can be controlled and curtail the level of disturbance which is created by monetary and fiscal policy. The country risk and government debt can be reduced, raise of households savings, reduce the marginal cost of raising revenue, increase rate of capital accumulation, and decrease the government encouragement to sustain level of fiscal policy by remittances. In nutshell, remittances upgrades public infrastructure and reduce crisis in the home countries.

#### REVIEW OF LITERATURE

The review of literature is provided basic foundation of the study. (Ozden & Schiff, 2006) have observed the financial influences of payments in recent years. These studies help us to understand the significance of remittances which is received by the labors who work in other states. For illustration, Ratha, (2003) highlighted that the remittances are main source of income for developing countries. Edwards & Ureta, (2003:429) stated that education is deeply influenced by remittances which are received from sending countries. Chami *et.al.*, (2005:55), shows in their empirical evidence that remittances had adverse upshot on economic growth. In recent years a study is conducted by IMF (2005) for 101 emerging states and it was found that there is no significant association among remittances and per capita output growth, education and investment rates. Faini, (2002) and Ang (n.d.:13) found that remittances and growth have positive association with each other. Ang (n.d.:13) study the effect of remittances and explore that there is encouraging connection between economic growth and remittances. It shows that the remittances can vary output over time across countries.

The technique of OLS and fixed effects are used to find the relationship between remittances and economic growth by Giuliano and World Bank (2006:114). They establish that there was adverse association among remittances and growth of GDP, the ratio between GDP and remittances, GDP per capita, the rate of investment rate, growth of population, percentage of GDP in version of the fiscal balance, duration of education, an elasticity of openness, and inflation. It finds the effects of remittances on economic growth with

the OLS cross-sectional, static and dynamic panel regression techniques. The association between per capita to GDP growth, the total remittances-to-GDP, regulatory for preliminary GDP per capita, proportions of gross capital construction and net private capital inflows to GDP, and Nations Human Development Index and remittances is positive. They found that effect of remittances on economic growth is very small. Notwithstanding the Word Bank in other studies find the positive relationship between remittances, education, financial debt and institutional quality.

#### **INSPIRATIONS AND VALUES OF REMITTANCES**

Human capital sending countries receive remittances from receiving countries. They send appropriate amount of remittances to their households and helpers in the homeland. The mechanisms of remittances are based on two main approaches: the “portfolio” approach and the “altruism” approach (IMF: n.d.:78). These tactics explain the behavior of remittances. The Lucas & Stark (1985) represented theoretical back ground regarding the factors of remittances and suggested the core factors of remittances are “pure self-sacrifice”, “pure egotism” and “egocentricity”. This is natural phenomenon that the emigrants send remittances to their family due to altruistic feelings and they know the level of poverty, living standard and social status of their family.

In this case, the study shows that there is an encouraging liaison among un-friendly circumstances of the getting family and payments sent and migrant income and remittances move in same direction (Funkhouser, 1995:137). Though, it is not necessary that remittances and income have a linear effect on living standard households. As Cox, Eser & Jimenez (1998:57), determine too, that receiving remittances may have a different effect on attitude and living standard of society. The migrants send remittances to their household because they have deep association with their families. The migrants may also send remittances for raise of wealth, income, formation of capital, assets and reputation in their society.

Stark (1991) and later by Stark & Wang (2002:159) stated that a strategic migration decision took place among countries because of wage deferential. Meanwhile high trained emigrants have taken large amount of remittances than unskilled workers from receiving countries. Thus we can conclude that skilled workers may have sent

more money than unskilled workers (Docquier & Rapaport (1998:579). It also advocated that income from remittances is raised with increase of education. The migrants' flows of remittances are based on the migrants' ability and their motivation to send their savings back to the homeland. Nevertheless, the willingness of send remittances to their family is determined by the duration of stay in the receiving countries. As Stark (1995) states that there is no absolute over-all theory of remittances. He advocated that the remittances upsurge the influx of overseas reserve to home nations which raise the demand of local currencies. Some researchers shows that amount of remittances appreciate the value of the Real Exchange Rate (RER). The theory of Dutch Disease proposes that influx of capital appreciate the real exchange rate, which decrease the level of export and boost up imports. This appreciation of exchange rate has an adverse influence on production because tradable areas are more productive than non-tradable areas. Dutch Disease (McKinleym, 2005:4) put less influence on unemployment or under employment. The idea that remittances shows poor economic efficiency was supported by Chami *et.al.*, (2003:77). He stated that there is adverse association between the volume of remittances and the GDP of home country. Furthermore he stated that moral hazard and asymmetric information bring adverse relationship between the size of remittances and GDP. On the other hand (IMF: n.d.:77) conducted study and stated that the aggregate output volatility is reduced in the home country because of raise of remittances.

The higher amount of capital flow in the country accumulate more quantity of capital through national saving and investment in the long run and have a positive effect on GDP. The basic consumption, education, social activities, capacity- building improve health conditions because inflow of remittances. It also acknowledged that remittances positively influence education and reduce poverty in the home country.

#### **MACROECONOMIC AND INFLUENCE OF REMITTANCES**

The effect of remittances to reduce poverty is not yet clear in macroeconomics level. The effect of remittances is ambiguous and doubtful either remittance has an encouraging, adverse or any other effect on economic growth. Chami, Fullenkamp & Jahjah (2003) developed a model which examine the relationship between

remittances and per capita GDP growth and find that remittances have negatively influence economic growth. Then in 2009, Barajas *et.al.*, (2009) attains that remittances have no influence on economic growth. Bettin & Zazzazo (2008) explore that remittances receiving countries have little effect on economic growth. In long term they concluded that remittances boots up performance of economics (Bettin & Zazzaro, 2008). They also suggested that there are some major reasons by which remittances have adverse effect on economic growth. *Firstly*, remittances create problem of Dutch disease. *Secondly* Chami, Fullenkamp & Jahjahha (2003) pointed out that the remittances generate an ethical hazard. This would reduce the productivity of the country and put negative effect on economic growth (Chami, Fullenkamp & Jahjah, 2003). *Thirdly*, Bettini & Zazzaro (2008) considers that remittances have not encouraged economic growth. The household family members have not intended to serve as investments but they purchase basics needs of life (Bettini & Zazzaro 2008).

#### REMITTANCES AND INDIRECT ECONOMIC ACTIVITIES

Most studies regarding emigration are based on the direct social and economic influences of migration, which shows that a remittance affects economic activities indirectly. Nevertheless, the significant impacts of remittances put influence on non-emigrant households, and reshape the infrastructure of sending communities as a whole (Taylor, 1996:65). The households who use remittances, their indirect effects are usually not captured. For instance, the most family members of households made expenditure on non-developmental activities. Nonetheless, remittances which are sent by brain drain consume on education, health and non-developmental activities. The consumption by emigrant households shows that a significant part of remittances is used for daily transactions, consumption, housing, purchasing of land, financial saving and productive investment. There is no doubt that is verified by (Adelman *et.al.*, 1988:5); Durand *et.al.*, (1996:249). He also suggested that mostly migrants spend their remittances on housing.

(Taylor *et.al.*, 1996) reproduce mutual exclusive interpretations on the illogical out lay performance of inferior classes, which is based on weak empirical basis. The remittances can create the construction activities and generate income and employment for non-migrants

(Taylor *et.al.*, 1996), (Mazzucato *et.al.*, 2006:). In this way, the benefits of remittances can be achieved by relative of the households.

#### REMITTANCES AND ECONOMIC GROWTH

World Bank, (Kireyev, 1999) and (Kapur, 2003) stated that the impact of remittances on social, economic development, economic growth and employment are undecided. Remittances have some different welfare effects which are given as: There are many low and middle-income countries which have main source of income is remittances. The commodities which are not available domestically, they can be imported with tool of remittances. Nonetheless, the impact of remittances can be seen that how they spend this money on goods and services.

#### MODEL OF ECONOMIC GROWTH AND REMITTANCES

In the literature, investigators in all countries want to close the gap between the remittances and long-run growth path. To find the receptiveness of economic growth rate to remittances and the traditional the sources of economic growth such as brain drain as human capital (BR<sub>it</sub>), remittances(REM<sub>it</sub>), and  $\mu_{it}$  is error term. We first specify a simple log-linear Cobb-Douglass production function as:

$$EG_{it} = A (BR)_{it}^{\alpha} (REM)_{it}^{\beta} \mu_{it} \text{-----(1)}$$

$$\ln(EG_{it}) = \ln A + \alpha \ln (BR)_{it} + \beta \ln(REM)_{it} + \mu_{it} \text{-----(2)}$$

$$A > 0; 0 < \alpha < 1$$

Where EG the economic growth is in physical unit, BR is the brain drain, and REM is the remittance which was sent by the brain drain who live in the abroad. Nevertheless,  $\alpha$  (the economic growth elasticity of brain drain) measure the percentage change in economic growth for a one percent change in brain drain while REM remains constant;  $\beta$  (the economic growth elasticity of REM) also measure the percentage variation in economic growth for one percent change in REM and A reflect level of technology, where  $\mu$  is error term . i is for countries i.e.  $i = 1, 2, \dots, n$  and from year  $t = 1, 2, \dots, T$ . Optimization of EG with respect to BR and REM can be determined as follow:

$$EG_{BR} = \alpha A (BR)^{\alpha-1} (REM)^{\beta}$$

and

$$EG_{REM} = \beta A (BR)^{\alpha} (REM)^{\beta-1}$$

For the sake of development of economy, new technology (A) is adopted and it is reflected in Total Factor Productivity (TFP).

Following Nelson and Phelps (1966), it is assumed that the relationship between technology and brain drain is positively. The growth rate of technology is symbolized by Nelson and Phelps as under:

$$D(tfp_t)/tfp_t = \psi(BR) tfp_t^* - tfp_t/tfp_t$$

$$\psi(BR) = 0 \quad \psi'(BR) > 0$$

So that the growth rate of technology is specifically based on brain drain and gap of actual and theoretical maximum level is of  $TFP_t$  and  $TFP_t^*$ .

#### DESCRIPTION OF THE PROXIES AND DATA SOURCES

The present study emulates a data of 3 countries. Furthermore, this study examined a time period from 2000-2014, which is based on 15 years. For this study here we take data of 3 countries. The dependent variable is measured into economic growth, it has been taken as the logarithm of GDP per capita as a proxy. Data has been taken from world indicator, various issues economics surveys of Pakistan, statistical year book of India, Central bureau of statistics of Nepal.

There is no harmonized data regarding the skill feature of global migrants in all countries. The numerous states do not accrue any qualitative statistics on their immigrants. The data which is gathered by states on their immigrants is based on a large heterogeneity due to educational discrepancies, by this reason data on immigration is not available in a proper form due to flows of educational level. Therefore uncivilized immigration rates are used as a proxy variable for data on the migrants.

Data of personal transfer from sending countries to receiving countries have been presented in % of GDP. The data indicator of mobile cellular subscriptions is consists of the number of postpaid subscriptions and active prepaid subscriptions (per 100 people).

#### EMPIRICAL RESULTS AND INTERPRETATIONS

The model is tested by the Hausman test, and we use fixed effects and random effects techniques, which yields robust results. The estimated results of fixed-effects model with heteroskedasticity corrected standard errors and T-test are represented in the column.



Nonetheless, the estimated results for the random- effects model with bootstrap standard errors are represented in Table 2. The correction for heteroskedasticity converts the pooled regression with heteroskedasticity corrected standard errors in the fixed effects model. The results are reported in columns in 1 with the magnitude of the coefficients.

**TABLE-2**  
**FIXED EFFECTS METHOD**

Variables	Estimations	Std.Error	T.test	p-value
Brain drain	0.2342132	0:0128312	11:1529	0
Remittances	0.1312654	0:0251166	2:7712	0.0043
Cell phone	0:0353652	0:0596872	4:1434	0

V\Notes: balanced panel ( $n = 15$ ,  $T = 15$ ,  $N = 135$ ) Fixed effect method.

R-Squared = 0:63321. Dependent variable:  $\ln$  (GDP *per* Capita).

The Haussmann specification test is used to compare results of fixed effects and the random effects model. The estimation of random-effects model is rejected at  $p < 0.05$  thus, the fixed-effects estimation is accepted. The findings of fixed effects model are reported in column 1 of Table 3. Generally, the outcomes disclose the predictable association among the GDP per capita income (GDP*it*) and the explanatory variables i.e., brain drains, remittances and technology (cell phone). The GDP per capita have the expected signs with their explanatory variables. All the coefficients of explanatory variables are represented elasticity in column 2.

**TABLE-3**  
**RANDOM EFFECTS METHOD**

Variables	Estimations	Std.Error	T.test	p-value
Brain drain	0.2342132	0.0128312	11.1529	0
Remittances	0.1312654	0.0251166	2.7712	0.004
Cell phone	0.0353652	0.0596872	4.1434	0

**Notes:** balanced panel ( $n = 15$ ,  $T = 15$ ,  $N = 135$ ). Random effect method.

Adj. R-Squared = 0:6290. Dependent variable:  $\ln$  (GDP *per* Capita).

The results of estimation are reported Table-3. They show that there is positive relationship between remittances and the GDP per capita (at  $p < .01$ ) of the countries and they are statically significant. The result indicates that about 0.13 percent rise in the average per

capita income if a 1 percent increase in the remittances of Pakistan, Nepal and India countries. Likewise, a 1 percent increase in human capital as measured by the percent brain drain upsurges GDP per capita by 0.64 percent. Moreover, it also find that use of cell phone has a positive and statistically significant impact on the real per capita GDP i.e., it is observed that a 1 percent increase use of cell phone will lead to about 0.03 percent upsurge in the GDP per capita. Additionally, results show that an economic growth surge up 0.23 percent if brain drain is raised up to a 1 percent. The results are based on the fixed and random effects models. They show account for the heterogeneity and fluctuations in the economic performance of India, Nepal and Pakistan.

### CONCLUSION

This study tries to find the effect of remittances, brain drain and use of cell phone on economic growth in India, Nepal and Pakistan. The outcomes indicate that remittances have positive influence on the GDP per capita of India, Nepal and Pakistan. The results indicates that a 1 percent increase in remittances lead to a 0.13 percent increase in the GDP per capita income, 1 percent increase in use of cell phone increase to a 0.03 percent in the GDP per capita income, similarly, 1 percent increase in use of brain drain lead a 0.23 percent in the GDP per capita income. The results show that explanatory variables and dependent have positive associations each other. The remittances of brain drain reduce budget constraint of families in receiving countries and improve their living standards. Consequently, the family's boots up spending on food, daily transactions, health care, biosocial intervention, social activities, and schooling expenses for their children.

### REFERENCES

- Adelman I J., *et.al.*, Life in a Mexican Village: A Sam Perspective'. *Journal of Development Studies*, 25(1), (1988).
- Alvin P. ANG, Workers' Remittances and Economic Growth in the Philippines (n.d.).
- Barajas A, *et.al.*, Do Workers' Remittances Promote Economic Growth?, (International Monetary Fund (IMF) July 2009).

Bettin G, *et.al.*, Remittances and Financial Development: Substitutes or Complements in Economic Growth?, *Money and Finance Research Group*, 2008.

Chami R., *et.al.*, Are Immigrant Remittance Flows a Source of Capital for Development, (IMF Working Papers, 2003).

Chami R., *et.al.*, Are Immigrant Remittance Flows a Source of Capital for Development, *International Monetary Fund Sta-Papers*, 52(1), (2005).

Cox D., *et.al.*, 'Motives for Private Transfers Over the Life Cycle: An Analytical Framework and Evidence for Peru'. *Journal of Development Economics*, 5 (February, 1998).

Cox D., *et.al.*, *Intergenerational Transfers and the Demonstration*, Working Papers in Economics, (Boston: Boston College, 1994).

Docquier F., *et.al.*, Are Migrant Minorities Strategically Self-selected?, *Journal of Population Economics*, 11(1998).

Durand J., *et.al.*, 'International Migration and Development in Mexican Communities', *Demography*, 33(2), (1996).

Dustmann C., *et.al.*, *Remittances and Temporary Migration*, Centre for Research and Analysis of Migration (London: Department of Economics, University College London, 2010).

Edwards AC, *et.al.*, 'International Migration, Remittances and Schooling: Evidence From El Salvador'. *Journal of Development Economics*, 72(2),(2003).

Faini R., 'Migration, Remittances and Growth'. Conference paper, (Helsinki: September 2002).

Funkhouser E., 'Remittances From International Migration: A Comparison of El Salvador and Nicaragua', *The Review of Economics and Statistics*, 77(1),(1995).

Kapur D., *et.al.*, Migration's New Payo, *Foreign Policy*, 1398 (November/December, 2003).

Kireyev A., 'The Macroeconomics of Remittances: The Case of Tajikistan, Pyramid Investment Schemes'. *Post-Communist Economies*, 11(3), (1999).

Lucas R., Stark O., 'Motivations to Remit: Evidence From Botswana'. *Journal of Political Economy*, 93(5), (1985).

Lucas RE, 'On Mechanics of Economic Growth'. *Journal of Monetary Economics*, 22, (July 1988).

Maimbo SM, *et.al.*, (eds.), *Remittances: Development Impact and Future Prospects*, (Washington DC: World Bank, 2005).

Mazzucato V., *et.al.*, Locating a Ghanaian Funeral: Remittances and Practices in a Transnational Context, *Development and Change*, 37(5), (2006).

McKinley T., Why is 'The Dutch Disease' Always a Disease? The Macro Economic Consequences of Scaling up ODA, (Brazil: UNDP, 2005).

Mitra P., *et.al.*, Turmoil at Twenty: Recession, Recovery and Reform in Central and Eastern Europe and the Former Soviet Union, (Washington DC: World Bank, 2010).

Ozden C., *et.al.*, (eds.), International Migration, Remittances and the Brain Drain, (Washington DC: The World Bank, 2006).

Ratha D., 'An Important and Stable Source of External Development Finance', *Global Development Finance*, (Washington DC: World Bank, 2003).

Stark O., 'On the Role of Urban-to-Rural Remittances in Rural Development'. *Journal of Development Studies*, 16(3), (1980).

Stark O., *Altruism and Beyond: An Economic Analysis of Transfers and Exchanges within Families and Groups*, (Cambridge: Cambridge University Press, 1995).

Stark O., Bloom DE, 'The New Economics of Labor Migration'. *American Economic Review*, 75(2), (1985).

Stark O., *The Migration of Labor*, (Oxford: Blackwell, 1991).

Stark O., *et.al.*, 'Migration Dynamics'. *Economics Letters*, 76, (2002).

Taylor J., *et.al.*, 'The Shadow Value of Migrant Remittances, Income and Inequality in a Household-farm Economy'. *Journal of Development Studies*, 32(6), (1996).

Taylor JE, The New Economics of Labor Migration and the Role of Remittances in the Migration Process, *International Migration*, 37(1), (1999).

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