*International Journal of Islamic Studies & Culture* *ISSN-2709-3905*
https://ijisc.com.pk/index.php/IJISC/index *PISSN2709-3891*
(Volume.4, Issue.3 (2024)
(July-September)

# Emigration Implications for Economic Growth and Human Capital Formation

**Dr. Muhammad Sarfraz Khan**
Department of Commerce, University of the Punjab, Gujranwala Campus at-sarfraz.khan@pugc.edu.pk
**Dr. Naveed Ul Hassan**
Lecturer, Department of Management Sciences, Virtual University of Pakistan at-naveed.hassan@vu.edu.pk
**Dr. Syed Hassan Bukhari**
Lecturer, Department of Management Sciences, Virtual University of Pakistan at-syed.hassan@vu.edu.pk
**Zameer Ahmad**
Instructor, Department of Management Sciences, Virtual University of Pakistan at-zameerahmad@vu.edu.pk

**Abstract**

Brain drains has always been considered an ominous aspect of the developing nations, whereby talented individuals of developing nations move to settle in a developed nation in order to have better employment and growth opportunities. The debate on brain drain is inconclusive and certain authors consider it positive for developing economies due to remittances and diaspora effects; others consider it bad because of flight of skilled human resource. I used data from developing economy of Pakistan between 1979-2017 and found that although emigration has negative implications for Pakistan, remittances of expatriates contributes positively towards economic growth of country. Further, it was also found that emigration or remittances did not have any influence on human capital formation. The study concluded that emigration is not bad for developing countries and recommended that expats should be encouraged to send more remittances to Pakistan.

**KEYWORDS:** Brain Drain, Emigration, Remittances, Pakistan

## Introduction

Brain drain has been much debated issue in context of its implications for economic growth. Recently, human capital formation was also added to the debate. Early debate on brain drain deemed it necessary to create a wage-labour equilibrium, where workforce abundant countries should export their extra human resource to countries with less human resource. Thus, under this system workforce was allocated in an optimal manner and create a wage equilibrium, where both sending and receiving countries would benefit from the activity (Grubel & Scott, 1966). Thus, according to Haque (2005), workforce was moved to other regions and become more productive. Subsequently, emigration was hailed for its ability to sustain economic growth and build innovative capabilities in an economy (Romer, 1986). Under these notions, migration was deemed good and anecdotes of its positive implications for economic growth of developed countries, particularly USA, were highlighted and established (Haque, 2005).

However, 'brain gain' of developed economies became 'brain loss' for developing economies. Haque and Kim (1995) provided that such brain loss caused a permanent reduction in economic growth of developed countries. Haque (2005), in this regard, noted income differences between countries, which he attributed to flow of talented human resource from lower income countries to higher income countries. Thus, the discussion on emigration shifted

towards 'brain drain' in developing countries and resulting loss of welfare and economic hardships. Subsequently, the debate took another turn and foreign remittances and other self-correcting mechanisms such like eventual return of emigrants to home country and diasporas were brought into equation and it was argued that these self-correcting mechanisms result in better economic outcomes in sending countries (Brock, 2016). However, it was argued that benefits from self-correcting mechanisms were lower in magnitude compared to the losses caused by brain drain (Hague, 2005) as more skilled human resource do not return to home country and developing countries lack opportunities and are unable to develop policies to attract and retain these high skilled personnel (Brock, 2016). Previous studies investigating implications of emigrations have documented a negative impact of brain drain for economic prospects of developing countries and for people left behind (Bhagwati & Hamada, 1974; Brock, 2016; Haque & Kim, 1995). Following these notions, Brock (2016) argued that developing countries should ban emigration.

On the other hand, certain studies contradict with negative connotations of brain drain. Rapoport (2017) argued that despite economic hardships, sending countries are able to attain net gain. Recent studies have supported these notions of positive implications of brain drain for developing economies (Stark, 2004; Solimanos, 2008; Docquier & Rapoport, 2012; Javed, Burdey, & Parvez, 2014; Shreshta, 2017). So, recent evidence on the implications of brain drain depict a positive picture of emigration and argue that remittances and other self-correction mechanism are beneficial for sending countries, but some studies has posed certain reservations in this regard. Like Niimi, Ozden, and Schiff (2010) argued that highly skilled emigrants do not remit much to their home countries. Previously, Benie, Docquier, and Rapoport (2008) also argued that low skilled emigration could be more beneficial for developing countries, while high skilled emigration results in suboptimal economic outcomes. Recently, Docquier and Machado (2015) also endorsed these notions of negative influence of skilled emigration for developing economies.

State of evidence on the implication of brain drain for developing countries is quite confusing and studies have tried to generalize their findings for whole world or for a region by considering data from more than one countries. This has caused more confusion to understand the issue as various developing countries could have varying characteristics of labour force and investigating all countries in one go could yield misleading results. This study investigates implications of brain drain for developing economy of Pakistan. Pakistan has long been exporting high skilled and low skilled labour force to middle eastern states, European countries and North American countries and remittances from these expatriates are hailed as survivor of Pakistani economy. Lastly, we did not find any empirical evidence concerning implications of emigration and its self-correction mechanism for developing economy of Pakistan. This study fills this void by providing empirical evidence on the influence of brain drain on economic growth and human capital development in Pakistan.

**Model and Data**

This study follows the empirical models tested by Beine, Docquier, and Rapoport (2001). Beine et al. (2001) used cross sectional data of 37 countries and regressed 3 models. The first model estimated migration with the help of GDP differential from OECD country, population of the country and public expenditures in education. Second model on the other hand, explained human capital formation by means of migration and public expenditures on education. Lastly,

third model estimates economic growth by means of explanatory factors of migration, human capital formation and remittances. This study excludes first model of Benie et al. (2001) as it does not aim at estimating the antecedents of migration, while second and third models are estimated in this study. The second model is the study estimates human capital formation, which is presumed to be a viable positive consequence of the brain drain. This model was further tested on 127 developing countries in Benie et al. (2008). Variables of ex ante human capital, population density as proxy of cost of education acquisition and foreign remittances were also included in this model to improve estimation.

Gibson and McKenzie (2012), in this regard, only regressed migration status against educational attainment, using survey data. Lastly, Nogma and Ismail (2013) estimated human capital formation using skilled migration rate, square of skilled migration rate, public expenditures on education, worker's remittances and GDP. They further used population size, distance and linguistic proximity as an explanatory variable in subsequent estimation of the model. This study uses blend of the variables used in earlier model, whereby human capital formation is estimated by means of independent variables of migration rates, public expenditures on education, EG, population and remittances. Variables of ex ante human capital formation and regional dummies were excluded from the model. So, following model is proposed to be tested in this study:

$$HCF_{it} = \alpha_{it} + \beta_1 Mig_{it} + \beta_2 Rem_{it} + \beta_3 PEE_{it} + \beta_4 EG_{it} + \mu \quad \text{-------} \quad \text{Eq. (1)}$$

Where,

HCF = Human Capital Formation

Mig = Migration Rates

Rem = Remittances

PEE = Public Expenditures on education

EG = Economic Growth

$\alpha$ = Constant

$\beta_1$ - $\beta_5$ = Coefficient estimates

$\mu$ = Error term

i = Cross section – country

t = time - year

The third model of Benie et al. (2011) tested the impact of migration, remittances and human capital formation on the economic growth of the developing countries using cross sectional data. Lastly, Javaid, Burdey, and Parvez (2016) estimated economic growth of India, Pakistan and Nepal by means of brain drain, remittances and technology diffusion. Further, there have been propositions that migration actually provokes trade in the theoretical and empirical literature on the brain drain (Combes, Lafourcade, & Mayer, 2005; Docquier & Rapoport, 2012; Imai et al., 2011; Rauch & Casella, 2003; Rauch & Trindade, 2002). Thus, this study considers migration rates, remittances, human capital formation, and trade as potential determinants of economic growth of the developing countries in the South Asian countries.

$$EG_{it} = \alpha_{it} + \beta_1 Mig_{it} + \beta_2 HCF_{it} + \beta_3 Rem_{it} + \beta_4 Trd_{it} + \mu \quad \text{-------} \quad \text{Eq. (2)}$$

Where,

EG = Economic Growth

Mig = Migration Rates

HCF = Human Capital Formation
Trd = Trade
$\alpha$ = Constant
$\beta_1$ - $\beta_5$ = Coefficient estimates
$\mu$ = Error term
i = Cross section – country
t = time - year

Following table provides definitions and measurement proxies of the variables included in the study:

Table 1: Variable Definition and Measurement

| Variable | Definition | Proxy |
|---|---|---|
| HCF | Human Capital Formation: Level of Higher Education in Home country | Gross Enrolment Ratio in Tertiary education as % of total Population |
| EG | Economic Growth of Home country | GDP Per Capita |
| Mig | Migration Rate: Skilled Migration from Home country to developed (OECD) country | Emigration Rate as % of Total Population |
| Rem | Remittances: Remittances from people living abroad | Remittances as % of GDP |
| PEE | Public Expenditures on Education: Total Government Expenditures on education in Home country | Govt. Expenditure on Education as % of GDP |
| Trd | Trade: Sum of exports and imports of home country | Trade as % of GDP |

## Results

### Descriptive Statistics

Table 2 provides descriptive statistics for the variables used in the study. Mean for economic growth was 2.24 along with a standard deviation of 1.85. Migration had mean of -0.22 along with standard deviation of 0.84. A negative average indicates that Pakistan has been net sender of emigrants. Further, remittance had mean of 5.16 and standard deviation of 2.26 and human capital formation had mean of 4.24 and standard deviation of 3.02. Public expenditures on education had mean of 2.36 and standard deviation of 0.39. Lastly, trade had a mean of 33.54 and standard deviation of 3.23.

Table 2: Descriptive Statistics

| Country | Statistics | EG | MIG | REM | HCF | PEE | TRD |
|---|---|---|---|---|---|---|---|
| Pakistan | Mean | 2.24 | -0.22 | 5.16 | 4.24 | 2.36 | 33.54 |
| | Standard Deviation | 1.85 | 0.84 | 2.26 | 3.02 | 0.39 | 3.23 |
| | Minimum | -1.45 | -0.89 | 1.45 | 1.31 | 1.41 | 25.31 |
| | Maximum | 6.69 | 1.74 | 10.25 | 10.35 | 3.04 | 38.91 |

**ARDL Estimation**

I estimated two equations, where first equation sought impact of emigration on economic growth, while second equation assesses impact of emigration on human capital formation in Pakistan.

**Emigration and economic growth**

ARDL model is used to estimate long run and short run dynamics of the Pakistani scenario on migration and remittances as to whether these two variables cause economic growth and human capital formation in country or not. Same two models were estimated for Pakistan, whereby first model estimated EG with help of migration, remittance, human capital formation, and trade; while second model estimated human capital formation with the help of migration, remittance, public expenditures on education, and EG. ARDL could be estimated in scenarios, where variables in the model are I(0) process and some are I(1) process. First in this section, stationarity of variables is checked using Augmented Dickey-Fuller (ADF) Test.

Table 3 provides test statistics for the variables concerning Pakistan and relative decision as to whether the variable is stationary at level I(0) or at first difference I(1). The null hypothesis for ADF test states that variable has unit root. For EG, we rejected null hypothesis at level as it was found that EG is a I(0) process. Subsequently, for migration we failed to reject null hypothesis at level, but rejected null hypothesis at first difference making migration a I(1) process. Next remittance was also found to be I(1) process. Same for human capital formation, and trade; all of these variables were integrated at the order 1; I(1). Lastly, public expenditures on education was integrated at level, making it I(0) process. So, there are some variables that are I(0) process and other are I(1) process. Thus, we may proceed with ARDL estimation.

Table 3: Augmented Dickey-Fuller Test

| Variable | ADF Test Statistic | Decision |
|---|---|---|
| EG | -4.182208** | I(0) |
| MIG | -2.151671 | |
| D(MIG) | -3.679756** | I(1) |
| REM | -1.44503 | |
| D(REM) | -6.026875** | I(1) |
| HCF | -1.000464 | |
| D(HCF) | -3.213175* | I(1) |
| TRD | -1.709312 | |
| D(TRD) | -8.085928** | I(1) |
| PEE | -3.767244** | I(0) |

** Significant at 1% level of significance (p<.01).

* Significant at 5% level of significance (p<.05).

In order to conduct ARDL bound testing approach, we need to determine optimal lag length i.e. number of lags to be included in the model. Five criteria of lag selection are used in this study i.e. LR test, final prediction error (FPE), Akaike information criteria (AIC), Schwarz information criteria (SC), and Hanna-Quinn information criteria (HQ). Minimum value of these criteria represents optimal number of lag according to each. We selected 1 lag as all five criteria deemed it optimal.

Table 4: Optimal lag order selection: Economic growth set

| LAG | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| **0** | -59.91097 | NA | 3.868123 | 4.187805 | 4.419093 | 4.263199 |
| **1** | -56.07514 | 6.186834* | 3.228171* | 4.004847* | 4.282393* | 4.095320* |
| **2** | -55.77432 | 0.465786 | 3.387182 | 4.049956 | 4.373759 | 4.155508 |
| **3** | -55.75266 | 0.032139 | 3.622397 | 4.113075 | 4.483136 | 4.233705 |
| **4** | -55.55731 | 0.277265 | 3.835510 | 4.164988 | 4.581307 | 4.300697 |
| **5** | -52.76314 | 3.785651 | 3.439225 | 4.049235 | 4.511811 | 4.200023 |
| **6** | -52.57917 | 0.237378 | 3.655617 | 4.101882 | 4.610716 | 4.267749 |
| **7** | -52.10783 | 0.577775 | 3.821639 | 4.135989 | 4.691081 | 4.316935 |
| **8** | -52.00058 | 0.124551 | 4.099302 | 4.193586 | 4.794935 | 4.389610 |

* indicates lag order selected by the criterion

After lag selection model was run and Wald test was employed to check long run co-integrating relationship between variables of EG, migration, remittance, human capital formation, and trade. Table 5 provides Wald test results for ARDL bound testing. F-statistics of the test was found to be 6.402677, which is higher than the critical values both at 5% and 1% level of significance. So, we reject null hypothesis stating that there is no co-integration between variables and accept alternate hypothesis stating that there is co-integration between variables of EG, migration, remittance, human capital formation, and trade.

Table 5: ARDL Bound Test Results: Economic growth set

| Test Statistic | Value | K |
|---|---|---|
| F-statistic | 6.402677 | 4 |
| Critical Value Bounds (k = 5, p<.05) | | |
| I(0) | 2.56 | |
| I(1) | 3.49 | |
| Critical Value Bounds (k = 5, p<.01) | | |
| I(0) | 3.29 | |
| I(1) | 4.37 | |

Critical values adopted from Pesaran, Shin, and Smith (2001).

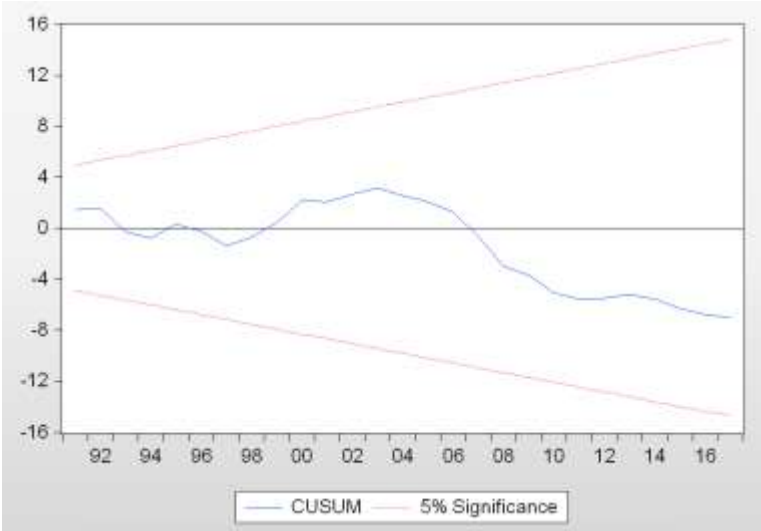
Further, in order to check the reliability and stability of the model, we checked the model for serial correlation and for its stability. For serial correlation, Breusch-Godfrey Serial Correlation LM Test was applied and stability of the model was checked through CUSUM was used. Table 6 provides results for serial correlation test and figure q provides the CUSUM. Serial correlation test provided F-statistics of 1.00214, which indicated that there is no serial

correlation in the model. CUSUM also showed that stability plot is within upper and lower bound of the critical values, indicating that the model is stable.

Table 6: Breusch-Godfrey Serial Correlation LM Test: Economic growth set

| | | | |
|---|---|---|---|
| F-statistic | 1.00214 | Prob. F(3,16) | 0.3814 |

Figure 1: CUSUM: Economic growth set




After establishment of the co-integration, long run estimates of the model are estimated. These estimates are provided in Table 7.

Table 7: Estimation of ARDL long run coefficients: Economic growth set

Selected model ARDL (1,2,2,0,0 )

Note: final equation sample is larger than selection sample.

| Variable | Coefficient | Std. Error | t. Statistic | Prob.* |
|---|---|---|---|---|
| EG(-1) | 0.337101 | 0.149644 | 2.252692 | 0.0326 |
| MIG | -39.18105 | 16.71051 | -2.344696 | 0.0266 |
| MIG(-1) | 71.21926 | 30.78044 | 2.313783 | 0.0285 |
| MIG(-2) | -36.34769 | 15.49041 | -2.346464 | 0.0265 |
| REM | 0.005009 | 0.361130 | 0.013871 | 0.9890 |
| REM(-1) | 0.170386 | 0.356134 | 0.478433 | 0.6362 |
| REM(-2) | 0.927008 | 0.353905 | 2.619366 | 0.0143 |
| HCF | -0.458463 | 0.251339 | -1.824080 | 0.0792 |
| TRD | -0.064135 | 0.108708 | -0.589979 | 0.5601 |
| C | -1.463590 | 4.268936 | -0.342846 | 0.7344 |

| | | | |
|---|---|---|---|
| R-squared | 0.509686 | Mean dependent var | 2.164889 |
| Adjusted R-squared | 0.346247 | S.D. dependent var | 1.721144 |
| S.E.of regression | 1.391630 | Akaike info criterion | 3.724288 |
| Sum squared resid | 52.28914 | Schwarz criterion | 4.159672 |
| Log likelihood | -58.89934 | Hannan-Quinn criter. | 3.877781 |
| F-statistic | 3.118523 | | |
| Prob(F-statistic) | 0.010549 | | |
| Durbin-watson stat | 2.275274 | | |

Long run estimates of the ADRL indicated that migration had negative relationship with the economic growth of Pakistan (p<.05). Subsequently, second lag of remittances was also found to have a positive and significant (p<.05) impact on the EG of Pakistan.

Lastly, error correction model is applied to check the adjustment mechanism of the model. Table 8 provides estimation results. It could be seen that error correction term (ECT) has negative coefficient of -0.662899 and it is also significant at 1% level of significance. This again indicated presence of long run equilibrium relationship between the variables. Further, it also shows speed of adjustment towards long run equilibrium and indicated that 66.29% of the adjustment is made in each period.

Table 8: Error Correction Model: Economic growth set

| ECM Regression | | | | |
|---|---|---|---|---|
| Case 2: Restricted Constant and No Trend | | | | |
| **Variable** | Coefficient | Std. Error | t-Statistic | Prob. |
| **D(MIG)** | -39.18105 | 7.257545 | -5.398665 | 0.0000 |
| **D(MIG(-1))** | 36.34769 | 7.025529 | 5.173659 | 0.0000 |
| **D(REM)** | 0.005009 | 0.243978 | 0.020531 | 0.9838 |
| **D(REM(-1))** | -0.927008 | 0.277776 | -3.337251 | 0.0025 |
| **CointEq(-1)*** | -0.662899 | 0.098242 | -6.747603 | 0.0000 |
| **R-Squared** | 0.586798 | Mean dependent var | | -0.081902 |
| **Adjusted R-squared** | 0.535148 | S.D.dependent var | | 1.874879 |
| **S.E.of regression** | 1.278294 | Akaike info criterion | | 3.454018 |
| **Sum squared resid** | 52.28914 | Schwarz criterion | | 3.671710 |
| **Log likelihood** | -58.89934 | Hannan-Quinn criter. | | 3.530765 |
| **Durbin-Watson stat** | 2.275274 | | | |

Overall, I found evidence of a long run equilibrium relationship between variables of EG, migration, remittances, human capital formation and trade. Once again remittance was found to be most important variable casing economic growth in developing economy of Pakistan.

**Emigration and human capital formation**

Subsequently, I estimated the second equation considering variables of human capital formation, migration, remittances, public expenditures on education and economic growth.

ARDL approach was also used for this estimation. First of all, optimal lag order length was selected. Table 9 provides the optimal lag order selection for the model. All five criteria indicated that first lag selection is optimal.

Table 9: Optimal lag order selection: Human capital formation set

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| **0** | -22.86203 | NA | 0.302164 | 1.638943 | 1.863408 | 1.715492 |
| **1** | -16.64375 | 10.24188* | 0.222649* | 1.331985* | 1.601343* | 1.423844* |
| **2** | -15.73178 | 1.448432 | 0.224306 | 1.337163 | 1.651414 | 1.444332 |
| **3** | -15.34378 | 0.593399 | 0.23323 | 1.373164 | 1.732307 | 1.495642 |
| **4** | -15.32145 | 0.032848 | 0.248009 | 1.430673 | 1.83471 | 1.568461 |

* Indicates lag order selected by the criterion

After lag selection ARDL bound testing was done through Wald test. Table 10 provides test results considering variables of human capital formation, migration, remittance, public expenditures on education and EG. F-statistics of the test was lower (.981521) compared to the critical values at 5% level of significance. So we fail to reject null hypothesis stating that there is no co-integration between the variables of human capital formation, migration, remittance, and EG.

Table 10: ARDL Bound Test Results: Human capital formation growth set

| Test Statistic | Value | K |
|---|---|---|
| F-statistic | .981521 | 4 |
| Critical Value Bounds (k = 4, p<.05) | | |
| I(0) | 2.56 | |
| I(1) | 3.49 | |
| Critical Value Bounds (k = 4, p<.01) | | |
| I(0) | 3.29 | |
| I(1) | 4.37 | |

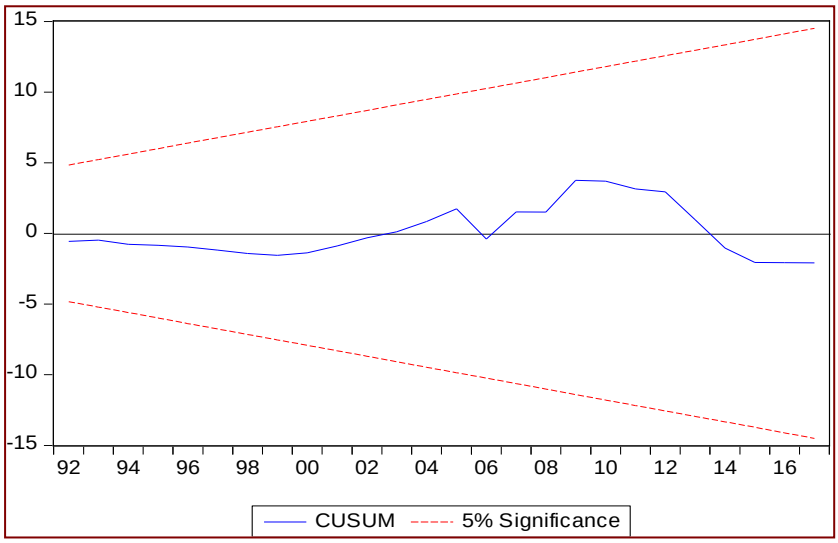
Critical values adopted from Pesaran, Shin, and Smith (2001).

Subsequently, diagnostic tests were run to check for the serial correlation in the model and to see model stability. Table 11 provides Breusch-Godfrey Serial Correlation LM Test, while figure 2 provides CUSUM for checking model stability. F-Statistic for the serial correlation test is 1.056078, which indicates that there is no serial correlation in the model. CUSUM also shows that the stability statistics are within upper and lower bounds and thus model is also stable.

Table 11: Breusch-Godfrey Serial Correlation LM Test: Human capital formation set

| | | | |
|---|---|---|---|
| F-statistic | 1.056078 | Prob. F(3,26) | 0.3623 |

Figure 2: CUSUM: Human capital formation set




Subsequently, long run estimates of human capital formation estimation were calculated, which are presented in table 12. Except lags of dependent variables, no other variable had any impact on human capital formation in Pakistan. This indicates that variables of migration, remittances, public expenditures on education and EG had nothing to do anything with human capital formation in Pakistan. Only lags of human capital formation were found to have caused human capital formation in the country.

Table 12: Estimation of ARDL long run coefficients: Human capital formation set
Selected Model: ARDL (2, 1, 0, 1, 0)

| Variable | Coefficient | Std. Error | t-statistic | Prob.* |
|---|---|---|---|---|
| HCF(-1) | 1.518867 | 0.157581 | 9.638633 | 0.0000 |
| HCF(-2) | -0.638123 | 0.169662 | -3.761152 | 0.0008 |
| MIG | 0.778763 | 0.707041 | 1.101440 | 0.2801 |
| MIG(-1) | -1.245156 | 0.804108 | -1.548494 | 0.1327 |
| REM | 0.200792 | 0.119905 | 1.674593 | 0.1051 |
| PEE | -0.579689 | 0.342699 | -1.691540 | 0.1018 |
| PEE(-1) | 0.577406 | 0.392372 | 1.471578 | 0.1523 |
| EG | 0.068146 | 0.050871 | 1.339594 | 0.1911 |
| C | -0.648449 | 0.806218 | -0.804310 | 0.4280 |
| R-Squared | 0.985286 | Mean dependent var | | 4.350803 |
| Adjusted R-squared | 0.981083 | S.D.deendent var | | 3.067500 |
| S.E. of regression | 0.421905 | Akaike info criterion | | 1.319701 |
| Sum squared resid | 4.984112 | Schwarz criterion | | 1.711546 |
| Log likelihood | -15.41447 | Hannan-Quinn criter. | | 1.457845 |
| F-statistic | 234.3767 | | | |
| Prob(F-statistic) | 0.000000 | | | |
| Durbin-Watson stat | 2.303412 | | | |

Lastly, error correction model was also estimated to see short run impacts on human capital formation growth in Pakistan. Table 13 provides vector error correction estimates for the model. It could be witnessed that error correction term (CointEq) was negative and significant in the short run model indicating the speed of adjustment. confirming that no long run relationship existed between human capital formation, migration, remittances, public expenditures on education and economic growth.

Table 13: Error Correction Model: Human capital formation set

| Variable | Coefficient | Std. Error | t-statistics | Prob. |
|---|---|---|---|---|
| D(HCF(-1)) | 0.638123 | 0.124891 | 5.109426 | 0.0000 |
| D(MIG) | 0.778763 | 0.546444 | 1.425148 | 0.1652 |
| D(PEE) | -0.579689 | 0.290049 | -1.998593 | 0.0554 |
| CointEq(-1)* | -0.119255 | 0.045266 | -2.634531 | 0.0136 |
| R-squared | 0.405674 | Mean dependent var | | 0.201400 |
| Adjusted R-squared | 0.351644 | S.D. dependent var | | 0.482648 |
| S.E. of regression | 0.388631 | Akaike info criterion | | 1.049431 |
| Sum squared resid | 4.984112 | Schwarz criterion | | 1.223584 |
| Log likelihood | -15.41447 | Hannan-Quinn criter. | | 1.110828 |
| Durbin-watson stat | 2.303412 | | | |

Overall, a long run equilibrium relationship was found between variables of economic growth, migration, remittances, human capital formation, and trade in Pakistan. However, this long run relationship could not be sustained between the variables of human capital formation, migration, remittances, public expenditure on education, and economic growth.

**Discussion and Conclusion**

There has always been a debate in context of brain drain and its relative implications for developed and developing economies. It has been argued that in the long run, developed economies are benefitted from brain gain, while developing economies lose on account of brain drain. There had been alternative arguments that entail that brain drain not necessarily is bad; it enables best human capital to occupy better employment opportunities in developed economies and as a result such human capital is able to remit to their home country by means of foreign remittances and thus both; home and host country are better off. Subsequent discussion also relates to the diaspora effect, whereby expats help to build human capital of home country through their linkages and skills learnt abroad. This research is an attempt to investigate this phenomenon of good or bad of migration for developing economy of Pakistan.

This research found that although migration has negative implications for economic growth of Pakistan, its self-correction mechanism positively influences economic growth in the country as remittances have positive influence on the economic growth of country. I also found that migration did not influence human capital formation in Pakistan directly or through remittances. Positive implications of remittance is consistent with recent evidence on the issue where Azam (2015) found evidence of a positive impact of remittances on South Asian economies. Siddiqui (2007) also provided that growing economies of South East Asia and Central Asia heavily rely on the workers from this region. These workers tend to send their earnings to their home countries. Rapoport and Docquier (2006) argued that these remittances are used to repay loans by the home countries. Overall, this study underscored the

role of remittances in supporting economic development in Pakistan where foreign remittances seem more important compared to emigration rates. Thus, economic policies of these countries should consider the ways to enhance foreign remittances. Expats must be encouraged to send money to their home country for investment as well as for consumption purposes. Thus, in the long run human capital formation and economic development of these economies could be sustained with the help of foreign remittances.

## References

Adams Jr, R. H., & Cuecuecha, A. (2010). Remittances, household expenditure and investment in Guatemala. *World Development*, *38*(11), 1626-1641.

Azam, M. (2015). The role of migrant workers remittances in fostering economic growth: The four Asian developing countries' experiences. *International Journal of Social Economics*, *42*(8), 690-705.

Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: theory and evidence. *Journal of development economics*, *64*(1), 275-289.

Beine, M., Docquier, F., & Rapoport, H. (2008). Brain drain and human capital formation in developing countries: winners and losers. *The Economic Journal*, *118*(528), 631-652.

Bhagwati, J., & Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis. *Journal of Development Economics*, *1*(1), 19-42.

Brock, G. (2016). Debating Brain Drain: An Overview. *Moral Philosophy and Politics*, *3*(1), 7-20.

Combes, P. P., Lafourcade, M., & Mayer, T. (2005). The trade-creating effects of business and social networks: evidence from France. *Journal of international Economics*, *66*(1), 1-29.

Docquier, F., & Machado, J. (2015). Global competition for attracting talents and the world economy. *The World Economy*.

Docquier, F., & Rapoport, H. (2012). Globalization, brain drain, and development. *Journal of Economic Literature*, *50*(3), 681-730.

Gibson, J., & McKenzie, D. (2012). The economic consequences of 'brain drain'of the best and brightest: Microeconomic evidence from five countries. *The Economic Journal*, *122*(560), 339-375.

Grubel, H. B., & Scott, A. D. (1966). The international flow of human capital. *The American Economic Review*, *56*(1/2), 268-274.

Haque, N. U. (2005). Brain drain or human capital flight. *Lectures in Development Economics*, (11).

Haque, N. U., & Kim, S. J. (1995). Human capital flight: Impact of migration on income and growth. *Staff Papers*, *42*(3), 577-607.

Imai, K. S., Gaiha, R., Ali, A., & Kaicker, N. (2014). Remittances, growth and poverty: New evidence from Asian countries. *Journal of Policy Modeling*, *36*(3), 524-538.

Javed, Z. H., Burdey, M. B., & Parvez, A. (2016). Brain Drain And Economic Growth In India, Nepal And Pakistan. *Grassroots*, *50*(1).

Ngoma, A. L., & Ismail, N. W. (2013). The impact of Brain Drain on human capital in developing countries. *South African Journal of Economics*, *81*(2), 211-224.

Niimi, Y., Ozden, C., & Schiff, M. (2010). Remittances and the brain drain: skilled migrants do remit less. *Annals of Economics and Statistics/Annales d'Économie et de Statistique*, 123-141.

Rapoport, H. (2002). Who is afraid of the brain drain? Human capital flight and growth in developing countries. *Palo Alto CA: Stanford Institute for Economic Policy Research, Policy Brief. April*.
Rapoport, H. (2017). Who is Afraid of the Brain Drain? A Development Economist's View (No. 2017-14). CEPII research center.
Rapoport, H., & Docquier, F. (2006). The economics of migrants' remittances. *Handbook of the economics of giving, altruism and reciprocity*, *2*, 1135-1198.
Rauch, J. E., & Casella, A. (2003). Overcoming informational barriers to international resource allocation: prices and ties. *The Economic Journal*, *113*(484), 21-42.
Rauch, J. E., & Trindade, V. (2002). Ethnic Chinese networks in international trade. *Review of Economics and Statistics*, *84*(1), 116-130.
Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of political economy*, *94*(5), 1002-1037.
Shrestha, S. A. (2017). No Man Left Behind: Effects of Emigration Prospects on Educational and Labour Outcomes of Non-migrants. *The Economic Journal*, *127*(600), 495-521.
Siddiqui, T. (2007). Temporary labour migration as a contribution to development: low skilled migration and measures to combat irregular migration. Civil Society Day, Global Forum on Migration and Development, The King Baudouin Foundation.
Solimano, A. (2008). The international mobility of talent: Types, causes, and development impact. Oxford University Press on Demand.
Stark, O. (2004). Rethinking the brain drain. *World Development*, *32*(1), 15-22.