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The Impact of Remittances on economic growth of South Asian Countries: An Overview of Bangladesh, India, Pakistan and Sri Lanka

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Abstract

This paper investigates the effect of employees' remittances on the monetary increase of four South Asian rising locations via way of means of using balanced panel information from 1977 to 2020. Pooled OLS, constant results, random consequences and dummy variable interplay fashions are used to estimate the effect of remittances. The empirical regression evaluation confirms a bad impact of remittances on financial boom in Bangladesh, Pakistan and Sri Lanka. Conversely, remittances have an advantageous effect on monetary boom in India. This research additionally shows a joint considerable and negative relationship between remittances and financial growth in these four nations.

Keywords

Remittances · Economic boom · Panel statistics · South Asia · Emerging international locations

Abbreviations

CLRM Classical linear regression model
FDI Foreign direct investment
FE Fixed effects
GMM Generalized method of moments
IMF International monetary fund
IV Instrumental variables
OLS Ordinary least squares
RE Random effects
WB World Bank
WDI World development indicators
CLRM Classical linear regression version
FDI Foreign direct funding

Introduction

Remittances can be defined as the part of income of migrant workers who comeback to the country of origin from the country of employment. According to the definition of International Monetary Fund

(IMF), employees' remittances refer to the fee of financial transfers this is dispatched from the employees living overseas for greater than 1 to 12 months and are recorded in unique sections of the stability of payments. Nowadays, remittances turn out to be a vital and reliable supply of outside investment and capital accumulation with inside the growing economy [3].

In growing nations, remittances play a critical position as a supply of family profits and are taken into consideration as a solid supply [4]. In 2017, India turned into the most important remittance-receiving country, while Bangladesh become the 8th in the global [46–48]. Every year, South Asian migrant employees dispatched a massive quantity of remittances that is a critical supply of monetary improvement. Remittances are used to elevate countrywide savings, lessen the constraint associated with forex and stability of payments, and make contributions to improvement budget. The remittances need to be transferred through formal channels together with financial institution drafts, cash switch companies, and others to maximize the inflows of remittances. Informal channels like traders, buddies or household without prison status must be avoided [27].

According to the neoclassical concept of migration, exertions movements from low-salary nations to highly excessive-salary international locations due to salary variations amongst international locations [23]. Remittances offer a manner of poverty discount and financial improvement while immigrants ship remittances to their home country [49].

On the alternative hand, this sort of migration to overseas could harm the improvement procedure whilst the houses of home country loses relatively knowledgeable and professional employees which is referred to as mind drain [41]. Thus, losses of human capital may also have an effect on monetary increase negatively as pondered with inside the neoclassical boom idea. Remittances may also have negative outcomes with inside the monetary context. It can also additionally hamper monetary boom thru change fee appreciation thereby making it much less competitive in global exchange [35]. It may additionally inversely have an effect on the exertions deliver choice of recipient households. Increase in remittances may be taken into consideration as a growth in non-hard work profits. Considering amusement as a regular good, families are predicted to call for extra amusement after receiving remittances with inside the shape of non-hard work profits. The studies of Rodriguez and Tiongson [36] shows that remittances lessen the hard work deliver of receiving families with inside the Philippines. Thus, remittances have a terrible effect at the exertions deliver choice of receiving own circle of relatives members, mainly girl members [42]. It can enhance inequality among households the ones are becoming remittances and people are now no longer. This technique makes recipient households depending on remittances and takes them away from efficient activities. Most of the time, this cash is used for intake rather than effective funding [17]. The bad dating among remittances and monetary boom implies the altruistic reason of remittances at the same time as it specifies the efficient reason if definitely associated. Sometimes, humans use unofficial channels like Hundi and Hawala to lessen the sending price of remittances that are known as casual remittances. Political balance and higher authorities' legal guidelines are undoubtedly associated with remittance influx [1]. Usually, humans use varieties of channels to switch price range: formal and casual. Government supervision and legal guidelines are related to for- mal channels along with banks, postal services, and cash switch operators and different cord switch services. In maximum cases, those channels are associated with excessive transaction charges and trade loss. Hundi is the casual machine used to ship remittances to Bangladesh. Hundi and Hawala exist in Pakistan, while the Hawala machine is understood to India. Though Hundi is casual, its miles prepared comprising a community of relationships like friendship, kinship and local attachment [33]. Favorable price and velocity of the casual channel Hawala cause the migrants of Sri Lanka locating it extra appealing than different formal channels [44].

Figure 1 suggests the quantity of remittances in 2017 of 4 nations. India turned into the pinnacle remittance-receiving country in the global receiving $69.zero billion in 2017. Bangladesh, Pakistan, and Nepal acquired $13.5, $19.7 and $7.2 billion, respectively, in that year. [46-48] In 2018, remittance boom is fore- solid at three.1%, 2.5%, 2.four% and 2.2% for Bangladesh India, Pakistan and Sri Lanka, respectively [45]

Figure 2 gives the fashion of remittance inflows in 4 decided on international locations s wherein India gets the very best quantity of remittance amongst all nations and there's a pointy distinction of remittance among India and different 3 international locations as India is the pinnacle remittance receiver within side the international. Pakistan and Bangladesh are the 5th and 8th remittance-receiving international locations, respectively [45]

Figure 3 shows the remittances as percent of GDP in Bangladesh, India, Pakistan, and Sri Lanka. In Bangladesh, the contribution of remittances on GDP accelerated until 2012 and after that, it decreased sharply. In India and Sri Lanka, the share of remittances in GDP multiplied gradually, at the same time as in Pakistan it indicates a risky fashion.

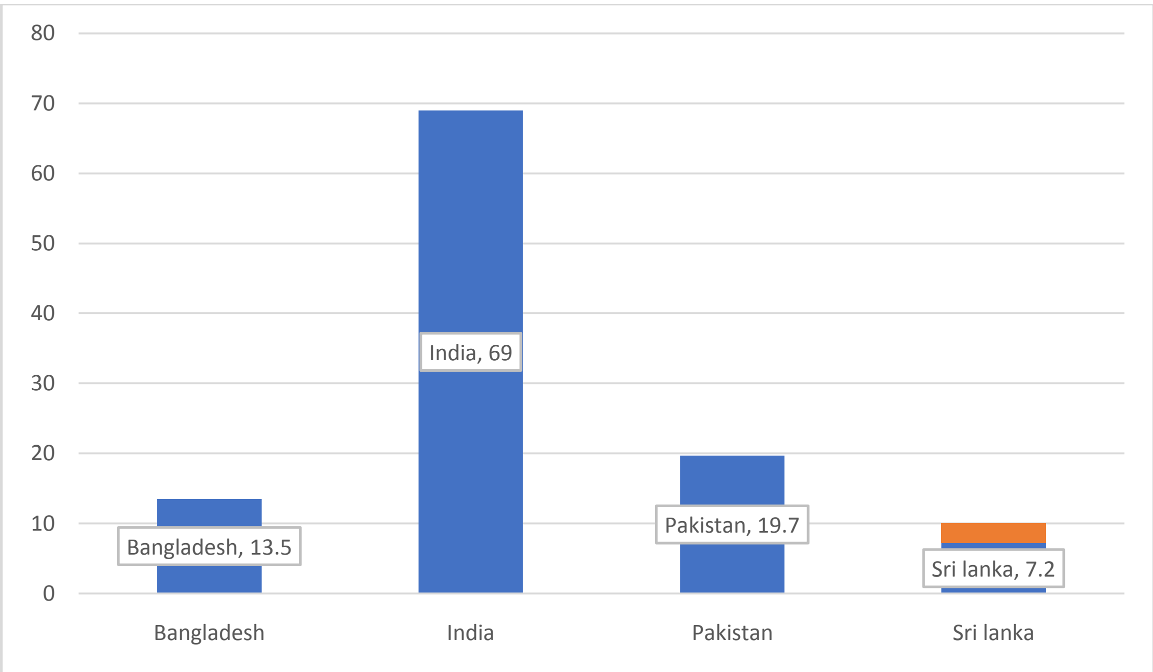

Fig. 1 Remittance inflows in 2017 ($ billion). Source: Author's compilation using World Bank Data [46-48]

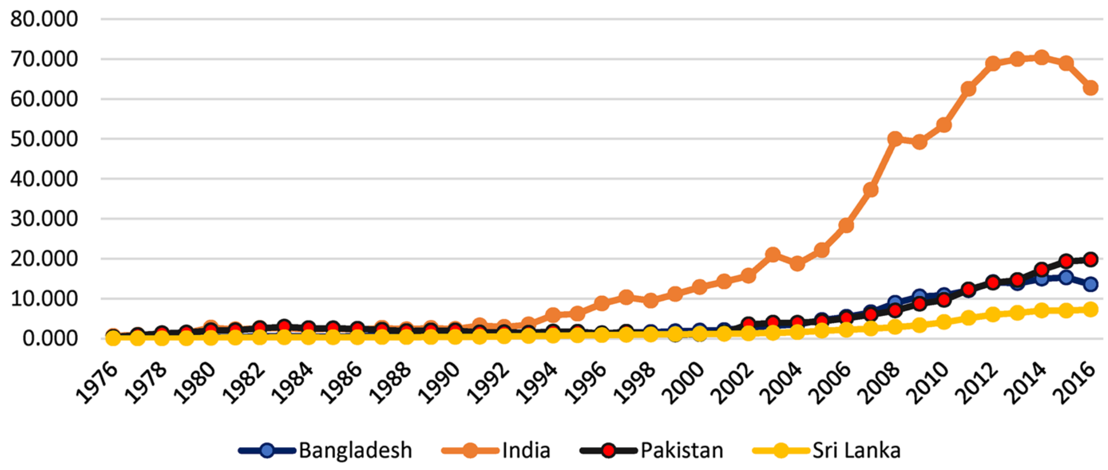

Fig. 2 Remittance inflows ($ billion). Source: Author's compilation using World Bank Data [46–48]

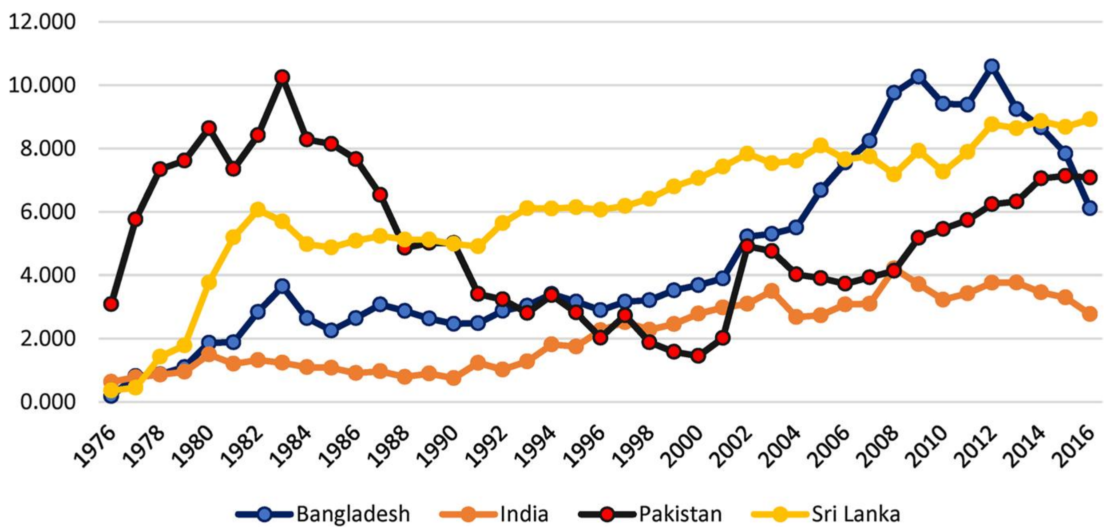

Fig. 3Remittances (% of GDP). Source: Author's compilation using World Bank Data [46–48]

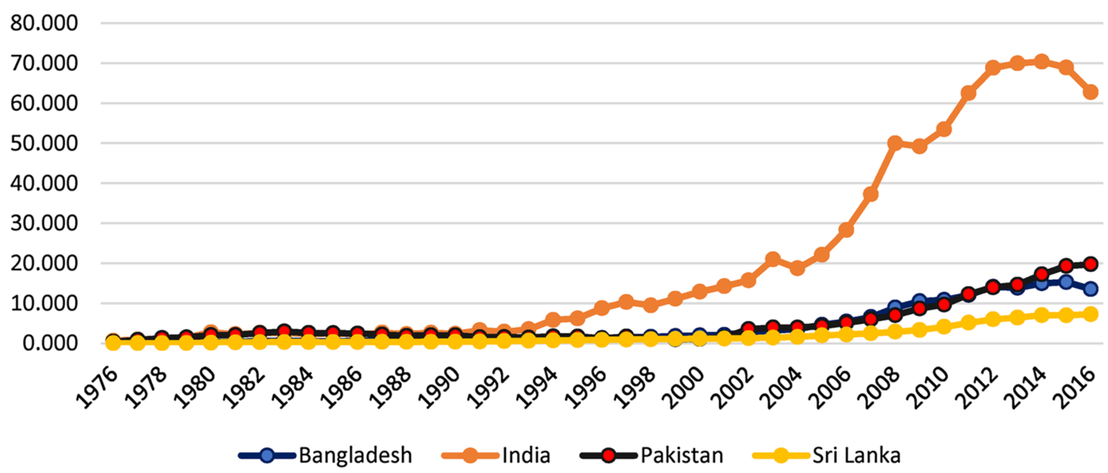

Fig. 4 Per capita GDP ($). Source: Author's compilation using World Bank Data [46–48]

Figure 4 implies the trend of per capita GDP ($) of Bangladesh, India, Pakistan, and Sri Lanka. Sri Lanka shows a sharp increase in per capita GDP and it is higher than other three countries from 1984 to the current period.

This paper is worried with the effect of remittances from 4 decided on count- attempts as those nations are rising and acquire a large quantity of remittances from all around the global whose effective usage may also enhance monetary boom. The purpose of this study is to study whether or not remittances have a giant effect on financial boom in South Asian rising international locations. In this regard, this paper aims to discover the connection among remittances and monetary increase of those counter attempts with inside the framework of neoclassical increase concept. Besides the joint effect, the person effect of remittances in Bangladesh, India, Pakistan, and Sri Lanka and the evaluation amongst those nations also are supplied with the reason of distinguishing the usage of remittance inflows. To behavior this evaluation, annual information of 40 years over the duration 1977–2016 have been accrued from the World Bank and IMF database.

Country-particular evaluation of remittances is delivered alongside the general effect of remittances in 4 rising international locations which means the originality of this studies, as maximum of the prevailing literature most effective offer the joint effect of remittances for growing or rising nations. Initially, pooled regular least squares (OLS), constant results (FE) and random results (RE) regressions are run to get the joint effect of remittances on financial increase for 4 rising international locations. Then, the dummy variable interplay version is used to discover the separate effect of every country. The F-check is likewise performed to check the joint importance of interplay phrases. Probability cost shows that interplay phrases are together sizable. Regression outcomes display that the joint effect of remittances is poor and considerable. The country specific particular dummy variable interplay version implies a bad effect of remittances in Bangladesh, Pakistan and Sri Lanka and effective effect in India.

The paper is established as follows. "Literature review" in brief discusses the literature on the connection among remittances and monetary increase. It includes the high-quality, bad, blended and impartial effect of remittances in distinctive international locations. "Methodology" explains the variables, facts supply, applicable fashions, methodology and empirical implementation of this observe. "Empirical effects" constitute the outcomes from the applicable estimation. Finally, "Conclusion" supplies the concluding remarks and recommendations.

Literature Review

The purpose of this paper is to investigate the connection among employees' remittances and monetary boom of 4 South Asian international locations, as those international locations get hold of sufficient remittances every year amongst which India is the pinnacle receiver of the global. There are many styles of studies at the effect of remittances. Since the paper specializes in financial boom, this segment will assessment best the proper and associated research to get a higher concept of the chosen topic. Pradhan et al. [30] analyzed the effect of employees' remittances on financial boom through using panel statistics of 25 years from 39 growing nations for the duration of 1980–2004 and discovered a nice and full-size effect of remittances on monetary increase. Fayissa and Nsia [15] researched the effect of remittances on monetary boom in 36 African international locations over the length 1980–2004 and identified a fantastic dating among remittances and financial boom. Ramirez [34] executed a take a look at which tested the effect of remittances at the financial boom, the use of panel facts of 23 upper- and lower-profits Latin American and Carib- bean (LAN) nations for the length 1990–2007. He expressed the advantageous and significant effect of remittances on actual consistent with capita GDP boom. Topxhiu and Krasniqi [41] covered six communist nations of Western Balkan (Albania, Kosovo, Macedonia, Montenegro, Bosnia and Herzegovina and Serbia) of their evaluation for the duration 2005–2015, the usage of balanced panel facts and discovered a high-quality effect of remittances on financial boom. Meyer and Shera [25] studied the diverse affects that remittances have at the monetary boom of six excessive remittances receiving counter attempts, Albania, Bosnia Herzegovina, Bulgaria, Romania, Macedonia and Moldova the use of panel facts set over the duration 1999–2013. Regression effects display a wonderful and sizeable contribution of remittances with inside the financial boom of the chosen six nations. Comes et al. [12] defined the relationship among remittances, foreign direct funding, and financial boom, the use of panel facts from seven international locations from Central and Eastern Europe overlaying the duration 2010–2016. The empirical end result expresses the wonderful impact of remittances and overseas direct investments on monetary boom for all decided on states.

Workers' remittance has a high-quality contribution to the monetary increase of Bangladesh [8, 11, 28, and 43]. But Bangladesh nevertheless calls for few upgrades to remittances shipping machine to keep away from the casual channel to simply accept the remittances from migrants. Remittances are the second one biggest issue of Pakistan economy. Worker's remittances and GDP boom in Pakistan over the length 1973–2011 are tested with the aid of using Hussain and Anjum [19] and the empirical end result indicates the advantageous and significant courting among remittances and GDP boom. Similarly, Ahmad et al. [2] assembled the records over the duration 1980–2010 in Pakistan wherein a sturdy effective affiliation among employees remittances and consistent with capita GDP is discovered. Cooray [13] located a fine and tremendous dating among remittances and monetary boom in South Asia through using panel information over the duration 1970–2008. Azam [7] tested the position of remittances in fostering financial boom in Bangladesh, India, Pakistan and Sri Lanka and discovered the wonderful effect of remittances on monetary increase in all nations. Another take a look at turned into carried out through Jawaid and Raza [21] for 5 South Asian nations the usage of long term collection information for the duration 1975–2009 and concluded that remittances have a longer term fine and large impact on monetary boom in Bangladesh, India, Sri Lanka, and Nepal, at the same time as it is vast however bad in Pakistan. Conversely, Chami et al. [10] blanketed 113 nations of their studies and concluded that remittances have a terrible effect on GDP boom the use of panel records of 29 years over the duration 1970–1998. They located a terrible correlation among the remittance's increase and monetary increase. They recognized the position of remittances as an altruistic which isn't always income driven. Karagoz [22] carried out a examine which tested the connection among employees' remittances and International Journal of Economic Policy Studies (2020) monetary increase in Turkey, the use of the time collection facts from the 12 months 1970–2005. The empirical consequences observed a bad affiliation among remittances and monetary increase in Turkey. Ferdaous [16] concluded that best a smaller portion of the remittances acquired in growing international locations are used for productive purposes, the use of a panel dataset of 33 growing nations for the duration 2003–2014. In any other look at, Oshota and Badejo [26] investigated the effect of remittances on financial increase in Nigeria for the length 1981–2011. Researchers observed a tremendous effect of remittances at the monetary boom of Nigeria with inside the longer term. On the alternative hand, with inside the quick run, a terrible dating exists among remittances and monetary boom. Pradhan [29] has used balanced panel information for 5 rising economies inclusive of Brazil, India, China, South Africa and Russian Federation over the duration 1994–2013 to have a look at the dating among remittances and the monetary increase of those nations. He discovered a wonderful dating among remittances and financial boom in China. The examinee additionally confirmed a sizeable and bad effect of remittances on monetary increase in Brazil, India and Russian Federation. The effect of remittances on monetary increase is wonderful and statistically insignificant in South Africa. Tolcha and Rao [40] analyzed the brief-run and long-run effect of remittances at the monetary increase of Ethiopia for the length 1981–2012. The end result suggests the widespread and poor effect of remittances on GDP in the long term, while remittances have a good sized and high-quality courting on the monetary boom with inside the brief run. Hasan and Shakur [17] had labored on a dataset of Bangladesh for the years 1976–2012 and recognized a non-linear dating among remittances and in keeping with capita GDP boom. They discovered a bad boom impact of remittances at first and the impact have become tremendous at a later stage. Besides those researches, Barajas et al. [9] concluded that employees' remittances do now no longer have any effect on financial boom in growing nations through employing the panel dataset of eighty four nations over the duration from 1970 to 2004. Shaikh et al. [37] aimed to investigate the connection among remittances and monetary boom of Pakistan the use of time collection facts of 35 years for the duration 1980–2014. Researchers discovered that non-public remittances don't have any impact on economic increase of Pakistan.

The above-defined literature in particular makes a specialty of the outcomes of remittances at the growing or rising economies. Researchers discovered distinct influences of remittances like wonderful, poor, blended and impartial. Most of those papers diagnosed both best the joint effect of a set of nations or effect of a person us of a. They did now no longer examine each influence. Further research ought to attention on those each factors of the outcomes of remittances. This paper gives the joint effect of remittances of 4 South Asian rising nations as previous research however additionally presents a further contribution to the prevailing literature through introducing a dummy variable interplay version. Individual effects of every country also are recognized with this version.

Methodology

The empirical implementation of the fashions used on this studies and associated exams are mentioned on this segment. Most of the research on panel statistics regression primarily based totally on growing or rising nations display the common effect of remittances on monetary increase however now no longer display person consequences do. Few studies show the individual impact on a single country using time series data. The intention of these studies is to pick out each the importance of the common effect of remittances for 4 South Asian nations on in keeping with capita GDP increase and their effect in Bangladesh and different international locations. A contrast of the effect amongst 4 nations may also be made later. The joint importance of character results can be done with the use of F-check. The idea of neoclassical boom version like Solow–Swan increase version is used right here to explicit the connection among consistent with capita GDP boom and remittances boom.

Econometric approach

Models

Meyer and Shera [25] and Topxhiu and Krasniqi [41] used the equal methodology for his or her studies associated with remittances and monetary boom. They have implemented pooled OLS, constant consequences and random results fashions for empirical analysis. These researchers simplest located the common effect of remittances and different explanatory variables at the monetary increase. This paper may be differentiated from their works as right here interplay phrases are used to specify the united states-unique influences of remittances and the mixed impact of remittances is likewise calculated for the 4 South Asian nations.

The pooled OLS, FE and RE fashions are used right here which might be the suitable fashions for panel information. After that, an easy dummy variable interplay version is employed. Panel statistics fashions are as follows:

$$(gdppcg)_{it} = \alpha + \beta(remg)_{it} + y`Z_{it} + €_{it} \quad (1)$$

$$(gdppcg)_{it} = \alpha + \mu + Ø_t + \beta(remg)_{it} + y`Z_{it} + €_{it} \text{Type equation here.} \quad (2)$$

$$(gdppcg)_{it} = \alpha + \mu + Ø_t + \beta(remg)_{it} + §D_{it} + y`Z_{it} + €_{it} \quad (3)$$

where (gdppcg)*it* is the gross domestic product per capita growth, x*it* is the country- specific, time-invariant effect, t is the time-specific, country-invariant effect, (remg)it is the growth in remittances, and Z it is the vector of explanatory variables (growth in foreign direct investment, growth in exports of goods and services, growth in exchange rate against USD, growth in gross capital formation). Subscript (*i*) represents countries (*i* = 1, 2, …, N), where N = 4. Subscript (t) represents time (*t* = 1, 2, …, T), where T = 40. it represents an error term.
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The error term is iid (independent and identically distributed), with zero meanand constant variance.
Heterogeneous effects of the four countries are addressed here by introducing theinteraction term of country dummy and remittance in the model. Country dummyfor each country is generated and interaction terms are created.

Research hypotheses

The research hypothesis implies that remittance coefficient is not statistically different from zero, whereas the alternative hypothesis indicates that it is statistically different from zero. Remittances can be considered as capital accumulation which is statistically significant and increases economic growth [25]. On the other hand, results may differ because of the lack of productive investment, and remittances play an altruistic role rather than profit driven [16]. Chami et al. [10] found such negative impact of remittances on GDP growth as remittances may reduce the labor supply and labor force participation rate of recipients. Thus, moral hazard problems are created from such non-labor income. “The moral hazard problem created by remittances can be severe enough to reduce economic activity. Our empirical estimations reveal considerable evidence both that remittances tend to be compensatory in nature and they have negative effects on economic growth” ([20], p. 21). Existing literature provides both positive and negative values of remittance coefficient against the null hypothesis. The above-discussed models will check the coefficient value of remittances. This research is attempted to find the answer of few research questions such as whether the inflow of remittances in these four countries have a significant

impact on economic growth. It also tries to find the nature and magnitude of the impact of remittances. Finally, a comparison is made among these four countries in this regard.
Thus, the null and the alternative hypotheses of this research are as follows:
H0 :β= 0
HA :$\beta \neq 0$

Empirical implementation

In the first step of estimation, the parameters of Eq. (1) are estimated by means of way of pooled OLS mannequin assuming no time-specific have an effect on and regular country-specific effect. Then, the parameters of Eq. (2) are estimated via way of the steady penalties model which controls the correlation between persona penalties and explanatory variables. After that, the estimation of Eq. (2) is offered the use of the random effects mannequin the neighborhood it is assumed that the man or female outcomes are uncorrelated with the regressors. In the 2nd step, pooled OLS, FE, and RF regressions are run for the dummy variable interaction mannequin as indicated with the aid of ability of Eq. (3). In the 1/3 step, indispensable tests are conducted to take a selection about which one is the fantastic model among pooled OLS, everyday effects, and random results models. Hausman check is carried out to pick out a model between RE and FE models. Then, to pick out between pooled OLS and random effects, Breusch–Pagan LM test is used. Finally, we get the rate of F-statistics from the Stata desk of FE model, to check the unobserved heterogeneity.

Variable selection and measurement

Economic increase models relate capital accumulation with growth. Solow [38] and Swan [39] developed the neoclassical amplify model that used to be the basis of highest quality increase theory. This model tries to relate financial increase with capital accumulation [14]. In this research, nominal variables are used for empirical distinction and dialogue purposes. The amplify charge of each variable is calculated and used for estimation purposes. Thus, established and all explanatory variables are expressed in share form. The monetary fee of these variables is expressed in USD. The trade price is measured in every country's domestic foreign exchange towards USD. In this research, capital accumulation is in the shape of remittance profits the area remittance boom is the integral explanatory variable and GDP per capita boom is the notably primarily based variable. Control variables are chosen especially particularly primarily based on related empirical increase literature and these are endorsed via using the utilization of the neoclassical amplify models. Foreign direct funding (FDI) growth, gross capital formation (GCF) growth, export growth, and trade charge expand are the control variables considered for this analysis. In this study, remittance measures the element of migrant workers' income that they ship to their domestic countries. Here, FDI functionality is the net inflow of overseas direct funding that implies the charge of a direct funding that comes from foreigners or non-resident merchants to the reporting or domestic country. GCF means the financial amount that is added to consistent property plus the web alternate in inventories. Equipment, machinery, plant, and constructions are considered constant assets and inventory consists of these items which are partly achieved and continue to be in production. Export means one country's export earnings from objects and services. The alternate price is the value of the domestic foreign money in terms of USD. GDP per capita implies per person's gross domestic product in a country. FDI, GCF, and export income are additionally related to capital accumulation. The alternate value in opposition to USD is some other explanatory variable whose increase implies a devaluation of the home currency. As a result, higher home currencies are required to import the equal extent of goods. Currency devaluation is additionally related to weakening the economic electrical strength of the domestic currency in international alternate even although it may additionally make bigger exports. The trend has an impact on will depend on the demand elasticity of exports and imports and special alternate policies. This variable is in a roundabout way related to world capital inflow or outflow to a country. Related look up regularly used explanatory variables from these variables to justify the have an effect on of remittances on economic growth. Pradhan [29] used remittances, export, and alternate charge as explanatory variables in his paper to appear at the affiliation amongst remittances, export, exchange rate and economic growth in rising economies. Gross capital formation (GCF), remittances, and overseas locations direct funding (FDI) are considered as explanatory variables in the find out about of Ferdaous [16] to unique the relationship between remittances and GDP per capita. From the database of the World Bank (WB) and International Monetary Fund (IMF), all facts are gathered. GDP per capita, the web influx of FDI, export, and GCF are gathered from the World Development Indicator (WDI) of the World Bank. Exchange price statistics are taken from the International Financial Statistics (IFS) of the International Monetary Fund (IMF). The grant of remittance records is the WB which is calculated by using the crew of people of WB chiefly primarily based truly on IMF and WB us of a desks.

Sample selection

This paper investigates the relationship between remittances and monetary prolong in four South Asian rising countries, in particular Bangladesh, India, Pakistan, and Sri Lanka. These 4 global places are sampled in view that all of them are rising and have available facts and information on per capita GDP, remittances, and first-rate control variables. A joint remarkable effect on of remittances is predicted in these international locations as a big extent of remittances is acquired in these worldwide locations each year. India used to be the pinnacle remittance-receiving in the world in 2017 ($69.0 billion), whilst Pakistan and Bangladesh had been in fifth and eighth position. For this analysis, facts from four countries have been accrued from the database of the IMF and WB.
For this research, a panel dataset for forty four years in the length 1977–2020 is used containing files from four countries. Here, nations signify the cross-sectional units. It is a strongly balanced panel on account that the dimension is the same for each and every country. Panel data from 4 nations are used over the duration 1976–2020 to measure the influence of remittances on economics of these rising countries. These worldwide places earn a widespread extent of remittances each and every 12 months amongst which India is the quality remittance-receiving states in the world [45]. The average impact of the panel is also specified to get an idea of ordinary South Asia. Thus, we can apprehend the existing scenario, discover the limitations and make suggestions for in a similar way improvement.

Theoretical background: remittances and boom theories

Remittance inflows have a large have an effect on the boom charge of productive capability in the receiving countries. This part examines how the inflows of remittances exert such impacts through special channels.

Remittance inflows and capital accumulation

Remittance inflows might also moreover stimulate funding in capital accumulation. Remittance-recipient households can make larger the accumulation charge of bodily and human capital [9]. Remittances moreover stimulate capital accumulation by means of way of elevating cash to the investors [21].

Remittance inflows and labor stress growth

The cost of labor inputs may additionally increase as a result of remittance receipts. It is predicted that remittance receipts have a horrific effect on labor stress participation addressing the moral hazard hassle as the recipient households deal with the inflows as non-labor revenue [9].

Remittance inflows and whole difficulty productivity growth

Remittances may additionally also have effects on entire issue productiveness enlarge with the useful resource of penalties on the affectivity of home investment. Remittance inflows may additionally moreover admire the real change rate. This implies Dutch disorder results in remittance-receiving countries. These consequences can also manifest if equilibrium true alternate price understanding penalties in the contraction of manufacturing sectors that generate dynamic manufacturing externalities [9].

Empirical results

This part attempts to talk about the stationarity tests, the estimated coefficients of chosen models, endogeneity, sensitivity analysis, and robustness of the core model.
In the first area of the estimation, the parameters of Eq. (1) are estimated by using the pooled OLS model. Fixed consequences and random consequences fashions are used to estimate the coefficients of Eq. (2). Using the dummy variable interaction mannequin brought in the final chapter, the 2nd part of the estimation technique is started. To acquire a model which satisfactory fits the archives and produces sturdy results, several types of Eq. (3) are tested.
For three fantastic fashions specially pooled OLS, consistent effects, and random effects, the panel regression is run. Finally, the Hausman [18] and Breusch–Pagan LM tests are performed to choose out the superb mannequin amongst these three models. Before going by means of these procedures, all the variables are checked by way of the use of unit root tests to appear at whether or no longer or no longer these are stationary or not. Other diagnostic assessments such as multicollinearity, heteroscedasticity, and autocorrelation are additionally performed.

Stationarity and other tests

Stationarity test of variables is the important part of the empirical analysis. In this study, unit root methods namely Fisher ADF (Augmented Dickey–Fuller) and Fisher PP (Phillips–Peron) are used.

Table 1 represents the results of both Fisher-type ADF and PP tests. Two different forms are used to get a clear idea about stationarity of all variables. The same testing procedure is run with and without trend. Test results confirm the stationarity at a level for all the explanatory variables including the dependent variable per capita GDP growth. So, these variables are integrated of degree 0, *I* (0).

Table 1 Panel unit root test result Source: Author's own calculations

Variables	At level				Order of Integration
	Fisher type (ADF)		Fisher type (PP)		
	C	CT	C	CT	
gdppcg	27.049***	15.838**	188.113***	162.494***	I (0)
remg	38.402***	30.573***	181.834***	175.520***	I (0)
Fdig	60.474***	51.087***	288.349***	288.349***	I (0)
Gcfg	32.963***	21.449***	151.304***	125.861***	I (0)
Expg	27.921***	19.601**	193.162***	180.005***	I (0)
Excg	29.373***	17.455**	101.187***	89.124***	I (0)

C indicates the specification with intercept; CT means specification with intercept and trend. Values with

***, ** and * are significant at 1%, 5% and 10% level of significance.

Main results

Table 2 represents the coefficients of explanatory variables of pooled OLS, fixed effects, and random effects regressions which confirm the negative and significant impact of remittances growth on GDP per capita growth in South Asian countries.

After running these three regressions, Hausman [18] test is conducted and it is seen that the fixed effects model becomes a better choice than the random effects model. Then, the Breusch–Pagan LM test is conducted and it is found that the pooled OLS is the better choice over random effects model. These results are similar to the research work of Topxhiu and Krasniqi [41]. Finally, we need to consider F-test where the null hypothesis of no unobserved heterogeneity can be rejected at5% level of significance. This implies the presence of unobserved heterogeneity and fixed effects model is preferable to a pooled OLS model. In the fixed effects model, the *R*2 value is 0.756 meaning that 75.6% variations in per capita GDP growth are explained by the explanatory variables.

So, fixed effects model is the appropriate model among the three models and the coefficients of this model are explained here. The results of the fixed effects model indicate that a 1% increase in remittance growth leads to 0.033% decrease in GDP per capita growth in South Asian emerging countries. On the other hand, FDI impact of these countries is statistically insignificant and negligible. It has a negative impact which is close to zero as the net inflow data of FDI is used here. When a given amount of FDI comes to these countries, simultaneously the existing foreign companies may return their investment to the home country. Higher political instability, the lake of rules and regulations in the domestic country are responsible for improper use of FDI. This finding can be related to the research of Topxhiu and

Krasniqi [41]. Capital accumulation is required for economic growth. A 1%increase in GCF growth results in 0.349% increase in GDP per capita growth. This result is consistent with the study of Ferdaous [16]. Export earnings are a prominent source of international currency inflow in emerging countries. Coefficient value implies that a 1% increase in export growth increases GDP per capita growth by0.082%. The exchange rate is very crucial in terms of international trade, as it plays an important role to determine the value of domestic currency. A 1% increase in the growth of the exchange rate reduces economic growth by 0.418%. These two results of exports and exchange rate are consistent with the analysis of Pradhan [29].

Table 2 Results of pooled OLS, fixed effects, and random effects models. Dep. variable: gdppcg

Variable	Pooled OLS	Fixed effects	Random effects
Remg	− 0.035*** (0.009)	− 0.033*** (0.009)	− 0.035*** (0.009)
Fdig	− 0.000** (0.000)	− 0.000 (0.000)	− 0.000** (0.000)
Excg	− 0.395*** (0.049)	− 0.418*** (0.048)	− 0.395*** (0.049)
Gcfg	0.360*** (0.028)	0.349*** (0.028)	0.360*** (0.028)
Expg	0.073*** (0.028)	0.082*** (0.027)	0.073*** (0.028)
Constant	4.838*** (0.662)	4.988*** (0.652)	4.838*** (0.662)
R^2	0.757	0.756	0.757
Observations	160		
No. of Countries	4		
Hausman test (RE vs. FE) (*p* value)	25.70 (0.000)		
Breusch–Pagan LM test (pooled OLS vs RE) (*p* value)	0.00 (1.000)		

Values with ***, ** and * are significant at 1%, 5% and 10% level of significance. Standard errors are reported in parenthesis.

Table 3 represents the robust results of Pooled OLS, fixed effects, and random effects regressions for the dummy variable interaction model which confirms the negative and significant impact of remittances on GDP per capita growth in Bangladesh.

Table 3 Robust results of dummy variable interaction model Source

Indicator	Pooled OLS	Fixed effects	Random effects
remg (Bangladesh	− 0.055*** (0.008)	− 0.051*** (0.002)	− 0.055*** (0.005)
Interaction 2 (India)	0.072*** (0.027)	0.092*** (0.002)	0.072*** (0.008)
Interaction 3 (Pakistan)	0.034 (0.021)	0.031*** (0.003)	0.034*** (0.004)
Interaction 4 (Sri Lanka)	0.051 (0.035)	0.010 (0.027)	0.051** (0.024)
Fdig	− 0.000*** (0.000)	− 0.000** (0.000)	− 0.000*** (0.000)
Excg	− 0.418*** (0.047)	− 0.396*** (0.058)	− 0.418*** (0.068)
Gcfg	0.342*** (0.042)	0.353** (0.073)	0.342*** (0.077)

Expg	0.081*** (0.026)	0.086** (0.026)	0.081*** (0.024)
Constant			
R^2	4.817*** (0.610)	4.599** (0.884)	4.817*** (1.371)
Observations	0.771	0.765	0.771
No. of countries	4		
Cluster–robust Hausman test (RE vs. FE) (*p* value)	10.14 (0.255)		
Breusch–Pagan LM test (pooled OLS vs RE) (*p* value)	0.00 (1.000)		

Values with ***, ** and * are significant at 1%, 5% and 10% level of significance. Robust standard errors are reported in parenthesis

After running the three regressions, pooled OLS, fixed effects and random effects for dummy variable interaction model, we need to choose the appropriate one with the help of Hausman [18] test and Breusch–Pagan LM test. Cluster–Robust Hausman test is used for the analysis with robust regression, as the Hausman test is not applicable for heteroscedasticity. By doing so, we decide to choose the random effects model over fixed effects model. Finally, Breusch–Pagan LM test is conducted and it is concluded that pooled OLS is the better choice over random effects model. These results are similar to the research work of Topxhiu and Krasniqi [41]. The R^2value of the pooled OLS model is 0.771 which implies that explanatory variables can explain 77.1% variations of per capita GDP growth.

Pooled OLS model is the appropriate model in terms of dummy variable interaction model and the coefficients of this model are explained here. Interaction terms show the marginal effect of remittances for each country. Here, Bangladesh is the base country. In India, the impact of remittances growth on economic growth is0.07% higher than Bangladesh. In Pakistan and Sri Lanka, it is 0.03% and 0.05%, respectively, higher than Bangladesh.

The result of pooled OLS indicates that a 1% increase in remittance growth leads to a 0.05% decrease in GDP per capita growth in Bangladesh. In India, this impact is positive, but it is also negative in Pakistan and Sri Lanka. A 1% increase in remittance growth increases 0.017% and reduces 0.021% and 0.004% per capita GDP growth in India, Pakistan and Sri Lanka, respectively. Of these four countries, India is the top remittance receiver in the world [46–48] and the positive impact of remittances in India implies the more productive use of remittances Values with 1%, 5% and 10% level of significance than the other three countries. On the other hand, FDI impact of these countries is statistically significant but it is negligible. It has a negative impact but is close to zero as the net inflow data of FDI is used for this research. In every year, FDI comes to these countries from different countries, whereas remaining companies may withdraw their investment. As a result, the net inflow of FDI may be negative if the amount of outflow is higher than the amount of new investment. A large number of factors are responsible for hampering positive outcomes from foreign direct investment in Bangladesh, like inadequate infrastructure, a slow-moving privatization process, an unskilled labor force, inefficient bureaucracy, political instability, and recurring natural disasters [32]. This finding can be related to the research of Azam [7], where the researcher found the negative and significant impact of FDI on economic growth. Gross capital formation can be considered as capital accumulation which is helpful for economic growth. A 1% increase in GCF growth results in 0.342% increase in GDP per capita growth. Ferdaous[16] also found the same relation between GCF and economic growth. Export earnings play an important role in international trade in developing countries. A1% increase in export growth increases GDP per capita growth by 0.081%. The exchange rate determines the value of the domestic currency in terms of foreign currencies that affect international trade. A 1% increase in the growth of the exchange rate reduces economic growth by 0.418%. These two results of exports and exchange rate are consistent with the analysis of Pradhan [29].

Lastly, to check the joint significance of interaction terms, F-test is performed. The P value of F-test is 0.000, thus null hypothesis can be rejected at 5% level of significance and it can be concluded that country-specific remittance coefficients are jointly statistically significant.

Endogeneity

To justify overlooked variable bias which can also occur from unobserved heterogeneity, cross-sectional effects can be blanketed [6]. Country-specific effects are included in this analysis. Fixed outcomes model is regarded for this learn about to incorporate and control unobserved heterogeneity. The hassle of endogeneity can be solved using instrumental variables (IV) estimation and generalized method of moments (GMM) estimation. GMM estimators are biased when the sample measurement is small because of the correlation between the moments and the weight matrix [5]. It is very hard to discover out an instrumental variable which is strongly related to the exposure. In case of a susceptible instrument or small correlation between the instrumental variable and the exposure, the IV estimator may additionally contain massive standard error. Instrumental variables (IV) estimator will be biased in a small sample. A small violation of the foremost assumptions of the instrumental variable will result in a biased estimation of IV even if the sample size is massive [24]. In this paper, the sample dimension is no longer too small, but it is not large adequate to use IV or GMM estimator. So, the fixed effects (FE) model is a better alternative for this lookup as IV or GMM requires a massive pattern to get impartial estimators.

Sensitivity and robustness

The behavior of core regression coefficient estimates can be checked by adding or removing repressor's to the main regression as a sensitivity test. Few experiments are provided with additional or fewer control variables. The model is re-estimated after excluding countries one by one with replacement. In each case, most of the estimates are largely unaffected in sign, size, and significance. So, most coefficient estimates of fixed effects model are less sensitive to such changes.

There is no multicollinearity among the explanatory variables for the fixed effects model. No first-order autocorrelation in the residuals and no heteroscedasticity of residuals are also confirmed. Different regression specifications imply the same conclusion of the negative relationship between remittances and the economic growth as the core model. Thus, this model can be considered as a robust model.

The same testing procedure is done for the dummy variable interaction model where pooled OLS is chosen. Inclusion and exclusion of control variables and exclusion of countries in turns do not affect largely most of the coefficient estimates in size, sign, and significance and are less sensitive to changes of regression specification. Robust standard errors can fight against heteroscedasticity and provide unbiased estimators. There is no multicollinearity and first-order autocorrelation in this model. This model is a robust model as again results get the same finding of the core model.

After conducting different tests, a negative relationship is found between remittances and economic growth across four South Asian emerging countries. This relationship is statistically significant. In Bangladesh, the impact of remittances on economic growth is also negative and statistically significant. Unproductive use of remittances may lead to negative economic growth. It may reduce labor supply also, as few families are getting money in the form of remittances without any work.

Sometimes remittances come through the improper channel and account for any a smaller amount than the original. These types of constraints are also responsible for adverse effects of remittances in the South Asian economy. By increasing the use of the proper channel and the productive use of remittances, these four countries may enhance their economic growth.

Conclusion

The important reason of this lookup is to analyze how remittances have an effect on per capita GDP boom in four countries of South Asia using the annual panel records over the period 1977–2016. The regression results express a poor relationship between remittances and monetary boom in South Asian nations barring in India. The empirical result indicates that a 1% enlarge in remittance increase leads to 0.05, 0.021 and 0.004% limit and 0.017% increase in GDP per capita increase in Bangladesh, Pakistan, Sri Lanka and India, respectively. The poor end result suggests that a larger element of remittances is used for non-productive functions like consumption. This tendency of spending shows the altruistic purpose of remittances as an alternative than profit driven. In India, remittances are used for productive purposes. Thus, it reflects profit-generating things to do relate to remittance inflows. Other variables such as FDI growth and exchange rate growth are statistically extensive and negatively associated to monetary growth, while boom in exports and gross capital formation are additionally large but have an effective impact on per capita GDP growth. Remittances can increase domestic consumption and limit poverty which is beneficial for the South Asian countries. The influx of remittances can also increase the income stage of the terrible human beings and help to minimize the poverty. Thus, remittances are really useful in case of poverty reduction rather than the economic growth [35]. Besides these, there are some destructive consequences of migration. Brain drain affected expresses the average stage of knowledgeable and educated people in employee sending countries. Thus, greater migrating countries mirror gradual economic increase compared to countries with lower migration costs [49]. The moral hazard trouble may additionally be created by remittances which ought to weaken the incentive to work for recipient families. This tendency may also decrease monetary activity. Policymakers need to convince both remitters and the recipients to make investments a larger element of the remittance flows for the productive cause [10]. Remittance inflow appreciates the actual alternate rate and decreases global exchange competitiveness of a country, which in turn deteriorates the economy. Thus, the influx of remittances impacts inversely the economy of a country through this process known as Dutch disease. By raising the exchange competitiveness, the government can limit the destructive Dutch disorder effect of remittance flows [31]. Dummy variable interaction model creates additional insights into this paper, as this helps to separate the country-specific person impact of remittances. To search and estimate remittances through casual channels and its contribution to economic growth are past the scope of this paper. For similarly studies, datasets for a prolonged length and more nations may provide a better and more robust analysis. In addition, extra control variables should be protected that have a specific have an effect on economic boom such as variables associated to human capital, migration and brain drain. Identification and estimation of remittances through informal channels may supply a clear idea about the authentic quantity of remittances. In the future studies, researchers have to focus on informal channels of receiving remittances. Governments and policymakers of these South Asian emerging countries should put extra emphasis on migration policies, and require amendment for the suited implication of these policies and the productive use of remittances to invulnerable monetary growth.

References

1. Abbas, F., Masood, A., & Sakhawat, A. (2017). What determine remittances to Pakistan? The role of macroeconomic, political and financial factors. *Journal of Policy Modeling*, *39*(3), 519–531.
2. Ahmad, M., Ilyas, M., & Abdul Rehman, C. (2016). The impact of workers' remittances on economicdevelopment of Pakistan. *Oman Chapter of Arabian Journal of Business and ManagementReview*, *34*(92), 1–7.
3. Al-Assaf, G., & Al-Malki, A. M. (2014). Modelling the macroeconomic determinants of workers'remittances: The case of Jordan. *International Journal of Economics and Financial Issues*, *4*(3),514–526.
4. Alfieri, A., Havinga, I., & Hvidsten, V. (2005). *Definition of remittances and relevant BPM5 flows,Department of Economic and Social Affairs*. New York: Statistics Division, United Nations.
5. Altonji, J. G., & Segal, L. M. (1996). Small-sample bias in GMM estimation of covariance structures.*Journal of Business and Economic Statistics*, *14*(3), 353–366.
6. Arestis, P., & Phelps, P. (2015). Endogeneity analysis of output synchronization in the current andprospective EMU. *JCMS: Journal of Common Market Studies*, *54*(3), 525–543.
7. Azam, M. (2015). The role of migrant workers remittances in fostering economic growth: Thefour Asian developing countries' experiences. *International Journal of Social Economics*, *42*(8),690–705.
8. Barai, M. K. (2012). Development dynamics of remittances in Bangladesh. *Sage Open*, *2*(1),2158244012439073.
9. Barajas, A., Gapen, M. T., Chami, R., Montiel, P., & Fullenkamp, C. (2009). *Do workers' remittancespromote economic growth?* (No. 2009-2153). International Monetary Fund.
10. Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows a source of capitalfor development? *IMF Staff papers*, *52*(1), 55–81.
11. Chowdhury, M. B. (2011). Remittances flow and financial development in Bangladesh. *EconomicModelling*, *28*(6), 2600–2608.
12. Comes, C. A., Bunduchi, E., Vasil, V., & Stefan, D. (2018). The impact of foreign direct investmentsand remittances on economic growth: A case study in Central and Eastern Europe. *Sustainability*,*10*(1), 1–16.
13. Cooray, A. (2012). The impact of migrant remittances on economic growth: Evidence from SouthAsia. *Review of International Economics*, *20*(5), 985–998.
14. Dohtani, A. (2010). A growth-cycle model of Solow-Swan type, I. *Journal of Economic Behavior &Organization*, *76*(2), 428–444.
15. Fayissa, B., & Nsiah, C. (2010). The impact of remittances on economic growth and development inAfrica. *The American Economist*, *55*(2), 92–103.

16. Ferdaous, J. (2016). Impact of remittances and FDI on economic growth: A panel data analysis.*Journal of Business Studies Quarterly, 8*(2), 58–77.
17. Hasan, G. M., & Shakur, S. (2017). Nonlinear effects of remittances on per capita GDP growth inBangladesh. *Economies, 5*(3), 1–11.
18. Hausman, J. A., 1978. Specification tests in econometrics. *Econometrica: Journal of the EconometricSociety*, *46*(6), 1251–1271.
19. Hussain, R., & Anjum, G. A. (2014). Worker's remittances and GDP growth in Pakistan. *InternationalJournal of Economics and Financial Issues*, *4*(2), 376–381.
20. Jahjah, M. S., Chami, M. R., & Fullenkamp, C. (2003). *Are immigrant remittance flows a source ofcapital for development?* (No. 3-189). International Monetary Fund.
21. Jawaid, S. T., & Raza, S. A. (2016). Effects of workers' remittances and its volatility on economicgrowth in South Asia. *International Migration, 54*(2), 50–68.
22. Karagoz, K. (2009). Workers' remittances and economic growth: Evidence from Turkey. *Journal o Yasar University*, *4*(13), 891–1908.
23. Kurekova, L. (2011) Theories of migration: Conceptual review and empirical testing in the contextof the EU East–West flows. In *Interdisciplinary Conference on Migration. Economic Change, SocialChallenge* (pp. 6–9).
24. Martens, E. P., Pestman, W. R., Boer, A. D., Belitser, S. V., & Klungel, O. H. (2006). Instrumentalvariables: Application and limitations. *Epidemiology, 17*(3), 260–267.
25. Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth: An econometricmodel. *Economia, 18*(2), 147–155.
26. Oshota, S. O., & Badejo, A. A. (2014). The impact of remittances on economic growth in Nigeria:An error correction modeling approach. *Zagreb International Review of Economics & Business,17*(2), 21–43.
27. Ozaki, M. (2012). Worker migration and remittances in South Asia. *South Asia Working PaperSeries*. Asian Development Bank.
28. Paul, B. P., & Das, A. (2011). The remittance-GDP relationship in the liberalized regime of Bangladesh:Cointegration and innovation accounting. *Theoretical and Applied Economics, 9*(9), 41–60.
29. Pradhan, K. C., 2016. Does remittance drive economic growth in emerging economies: Evidencefrom FMOLS and Panel VECM?*Theoretical & Applied Economics*, *23*(4), 57–74.
30. Pradhan, G., Upadhyay, M., & Upadhyaya, K. (2008). Remittances and economic growth in developingcountries. *The European journal of development research, 20*(3), 497–506.
31. Rabbi, F., Chowdhury, M. B., & Hasan, M. Z. (2013). Macroeconomic impact of remittances andthe Dutch disease in a developing country. *American Journal of Economics, 3*(5C), 156–160.
32. Rahman, A. (2015). Impact of foreign direct investment on economic growth: Empirical evidencefrom Bangladesh. *International Journal of Economics and Finance, 7*(2), 178–185.
33. Rahman, Md M, & Yeoh, B. S. A. (2008). The social organization of Hundi'. *Asian PopulationStudies, 4*(1), 5–29.
34. Ramirez, M. D. (2013). Do financial and institutional variables enhance the impact of remittances?On economic growth in Latin America and the Caribbean? A panel Cointegration analysis. *InternationalAdvances in Economic Research, 19*(3), 273–288.

35. Ratha, D. (2013). The Impact of remittances on economic growth and poverty reduction. *MigrationPolicy Institute*, Policy Brief. No. 8.
36. Rodriguez, E. R., & Tiongson, E. R. (2001). Temporary migration overseas and household laborsupply: Evidence from Urban Philippines. *The International Migration Review*, *35*(3), 709–725.
37. Shaikh, G. M., Tariq, M., & Shakri, I. H. (2016). Remittances and economic growth in Pakistan: Atime series analysis. *Global Management Journal for Academic & Corporate Studies*, *6*(2), 36–48.
38. Solow, R. M., 1956. A contribution to the theory of economic growth. *The Quarterly Journal ofEconomics*, *70*(1), 65–94.
39. Swan, T. W., 1956. Economic growth and capital accumulation. *Economic Record*, *32*(2), 334–361.
40. Tolcha, T. D., & Rao, P. N. (2016). The impact of remittances on economic growth in Ethiopia.*Indian Journal of Commerce and Management Studies, 7*(2), 1–15.
41. Topxhiu, R. M., & Krasniqi, F. X. (2017). The relevance of remittances in fostering economicgrowth in The West Balkan countries. *Ekonomika*, *96*(2), 28–42.
42. Vargas-Silva, C., Jha, S., & Sugiyarto, G. (2009). Remittances in Asia: Implications for the fightagainst poverty and the pursuit of economic growth. *ADB Economics Working Paper Series*. No.182, Asian Development Bank.
43. Wadood, S. N., & Hossain, Md. A. (2015). Impact of overseas remittances on economic growth:Evidences from Bangladesh. *Munich Personal RePEc Archive*. Paper No. 81657https ://mpra.ub.unimuenc hen.de/81657 /.The Dhaka University Studies [*Journal of the Faculty of Arts*], *70*(1),93–111.
44. World Bank. (2005). *Migrant labor remittances in South Asia*. Washington, DC.
45. World Bank. (2017). *Migration and development brief 28*. Washington, DC.
46. World Bank (2018). *Migration and development brief 29*. Washington, DC.
47. World Bank. (2018). *World Bank open data*. [Online]. Available at:https ://data.world bank.org/.
1. Accessed 28 June 2018.
48. World Bank. (2018). *Migration and remittances data*. [Online] Available at: http://www.world bank.
2. Org/…/migrationremittancesdiasporaissues/…/migra tion-remitances-d.Accessed Apr 2018.
49. World Bank & Asian Development Bank. (2018). *Migration and remittances for development inAsia*. Washington: DC, Metro Manila.