

Material Well-being triggered by Macro-Economic Variables: Evidence from South Asia

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Abstract

The present study aimed at analyzing the material well-being (WB) triggered by macroeconomic variables for selected countries i.e., Pakistan, India and Bangladesh. The study incorporated three separate operational models to observe their influence on WB of each selected country. For the sake of study time series dataset were collected for the time period of 1983 to 2015. Countries selection was made on the basis of IMF ranking and World Bank ranking for the year 2016. This ranking was based on the PCI of nations. First of all selected macroeconomic data were tested by applying unit root test i.e., Augmented Dickey-Fuller (ADF). Findings suggested that Autoregressive Distributed Lag Model (ARDL) as the most appropriate technique for the estimation of the long-run (LR) and short run (SR) outputs. Results of study showed that in the LR material WB could attribute positive impact on government expenditures, foreign direct investment (FDI) and remittances. On the other hand, there was a decline in material WB due to inflation and unemployment in the LR.

Keywords: well-being, GDP, unemployment, inflation, remittances, FDI

Introduction

There are several definitions of economics as a discipline. One of the most important goal of economics discipline is to increase the WB of individuals [Mankiw, 2009 and Goodwin et al. 2008]. Basically well-being (WB) or wellness, is commonly used term for the good condition of individuals or even groups (Diener 2009; Huppert et al. 2005; Huppert 2009; Seligman 2011). WB have a great importance for different disciplines, like as economics, social, philosophical, psychological, emotional or even medical state. A higher level of WB means, in certain sense the people or group's situation is positive, while lower WB is related to negative happenings. WB is used in many contexts. When WB used as an indicator of quality of life, which is usually based on primary income GDP per capita (Fox, 2012). Quality-of-life indications include employment status, education status, wealth, leisure, physical and mental health, pleasure, and related to others available environmental services. WB of individuals or groups generally referred as quality of life (Fox, 2012).

Concept of WB was not a central concern of early and mid-20th century economists (Bruni and Porta 2005). Relationship between GDP and happiness over the time period was firstly investigated by Easterlin (1974), who quantified the correlation among income level and happiness across country. Inspired by his research, a lot of research studies were conducted afterwards on the economics of happiness over last two decades relating to both type of research by economists and psychologists to access individual happiness (Bruni and Porta, 2005). Now, it is becoming the most progressing area of interest among economists for the development and improvement in the material WB of individuals in term of macroeconomic variables, and income [NG, 2008, Kahnemann and Krueger, 2006]. Newspaper and other economic information sources reported change in

macroeconomic variables on daily basis (Frey and Schneider, 1978). Individual's WB is strongly related to macroeconomic conditions of an economy (Blanchflower et al., 2014).

Money buys life satisfaction rather than happiness (Kahneman and Deaton, 2010). If politicians and their associates want to stimulate happiness and WB of individuals they need to take in account their "revealed preferences" and "stated preferences" (Ott, 2010). However, in present day's researchers mostly supported happiness as a political goal based on correlation between institutional and social factors. Happiness maximization is as a social goal is not an obligation of government of a nation (Duncan, 2010).

The concept of happiness and WB are very likely help to guide to welfare economic concept. Policymakers had paid too much attention to the GDP without considering the real social welfare standard (Fleurbaey, 2009). When policymakers pursue in a lopsided manner forgetting about environmental and social behavior the results can be adverse for human WB. Empirical research studies on happiness provide better understanding about the effect of institutions (Frey and Stutzer, 2002).

Analysts generally used happiness or subjective WB data to address public and economic policies, related to the most of the non-marketed goods like as health, quality of leisure, marital and family relationships. Quality of government is known to have the potential to contribute individuals and society happiness. From the Utilitarian viewpoint, public policy should be focused on greater happiness for larger number of people (Goodin, 1995).

Giving the evidence of this legal view (Frey and Stutzer 2012), the results explored from happiness research are taken as inputs into the political process. These inputs then have to prove themselves in political competition and in the discourse among citizens, and between citizens and politicians". Just before these, the purpose of this study is to verify happiness determinants in selected countries based on different macroeconomic variable in social and financial aspects.

Within south Asian nation like, Pakistan, India and Bangladesh this topic has not been much focused till now. There is not much literature available on happiness determinants which consider, apart from personal information, a group of social economic macro-variables, for these countries. This can be a highly encouraging fact for that development of the research. Another fact is that this issue had widely analyzed by researchers and public managers internationally, and the fact that happiness studies can become important tools to guide public policies trying to improve wellness of the society (Ng and Ho, 2006).

The objective of present research study is to determine the impact of macroeconomic variables on material WB for selected countries on the basis of per-capita income (PCI). It is used as an economic indicator, which shows the total output produced in an economy over the period relative to the population. PCI reveals the WB of total population. Selection of the study sites was on the basis of IMF and World Bank ranking of nations according to PCI for the year 2016. Globally accepted purchasing power parity (PPP) was method used to compare different countries PCI (Frey et al., 2008).

India was ranked at 123th which is 14% better than Pakistan. World bank report revealed that PCI of India is often more than that of Pakistan. Pakistan was ranked at 134th position and Bangladesh at 139th. India's PCI is 6616US\$ while PCI for Pakistan was 5106US\$.

Section is about the background of study in the section two presents the model specification, section three elaborates the empirical findings of the study and last part of manuscript is devoted to conclusions and policy suggestion.

Literature Review

An overview of previous research studies given as below;

Easterlin (1974) investigated the relationship between Gross Domestic Product (GDP) and happiness over the time period. He argued that higher level of a country GDP per capita does not affect the self-reported level of individual's happiness among the citizens of a in a specific country or city. Similar results are also followed by together Hirsch (1976). Diener et al. (1985) compared the happiness of wealthy persons with control group liven in same geographic area. They found that wealthy person had more often self-esteem. Scitovsky (1992) indicated a positive relationship between income level and happiness. Blanchflower (1993) used the happiness and USA economy data and indicated that there is an increase in happiness while economic growth increased. Clark and Oswald (1994) conducted study to determine the relationship between unemployment and happiness.

Winkelmann and Winkelmann (1998) study based on individual panel data set had found a negative impact of personal unemployment on life satisfaction. Kenny (1999) firstly observed the bidirectional causality between economic growth and happiness. Argyle (2001) explored a positive relationship between happiness and economic growth but that relation is the most significant in poor countries. Frey and Stutzer (2002) found how much economic poverty and policies are responsible for individual's unhappiness. Study suggested that in order to increase WB there should be proper availability of employment opportunities to individuals.

Sanfey and Teksoz (2005) showed that in case of transition, countries macroeconomic indicators such as inflation, GDP per capita and Gini coefficients had significant impact on the happiness. Peiro (2006) indicated that socio-economic factors such as age, health and marital status had significant and positive correlation with happiness and life satisfaction. In addition, income hold a strong relationship with financial satisfaction rather than life satisfaction and happiness across different countries. Blanchflower (2007) analyzed the both macroeconomic and microeconomic determinants of happiness from the perspective of 25 (twenty-five) OECD countries. Results of the study showed that unemployment, inflation and interest rate had negatively and significantly impact on happiness in OECD countries. Agan *et al.* (2009) found that there exist a significant and positive relationship between macroeconomic indicators while as positive relationship was examined between GDP and happiness.

Caner (2015) confirmed that happiness was positively related to greater relative income. Demographic factors such as age, education, gender and marital status of individuals in case of Turkey. Wang and Luo (2014) found that there exists U-shaped association between income inequality and happiness in China. Eren and Asici (2016) showed that average women are happier than men while as, being married makes people happier only if they are satisfied from their marriage.

Majority research studies explored the relationship between happiness and socioeconomic indicators while as a little research studies checked the association between happiness and macroeconomic indicators. The literature found that all socioeconomic indicators like as age, income level, education, marital status, health, employment status, gender and all other indicators play a leading role on happiness level of individuals in an economy. Employment status, education, income, poverty, availability of resources, leisure, quality of life, health, human capital, environmental degradation and life expectancy are the leading indicators which affect the welfare or WB of a nation or an individuals.

Data and Methodology

Data Description

The study is based on key macroeconomic indicators which influence the material WB of a country. Time series dataset were collected for the time period of 1983 to 2015. Countries selection was made on the basis of IMF ranking for the year 2015. This ranking was based on the PCI of nations. First of all selected macroeconomic data were tested by applying unit root test i.e., ADF. Findings suggested that Autoregressive Distributed Lag Model (ARDL) as the most appropriate technique for the estimation of the LR and SR results of present study.

By taking into account all independent and dependent variables following models was used in the study.

$$\text{Material WB} = \text{intercept} + \text{MACRO}_{jt} + \mu_{jt} \quad (1)$$

Material WB reported by country j in year t . In addition, MACRO_{jt} is a vector of macroeconomic variables that vary only by country j and time t included inflation, unemployment, Government expenditures, foreign direct investment and remittances. To trace out the results of the study all included variables are taken in natural log form. PCI was used as a proxy of material WB. Equation 2 determines the impact of macroeconomic indicators on PCI (material WB) in case of Pakistan.

$$L(\text{PCI})_j = \beta_0 + \beta_1(L\text{inf})_{jt} + \beta_2(L\text{unemp})_{jt} + \beta_3(L\text{remm})_{jt} + \beta_4(L\text{Gexp})_{jt} + \beta_5(L\text{fdi})_{jt} + \mu_1 \quad (2)$$

β_0 and β 's are intercepts and elasticity of economy's output with respect to each explanatory variables and μ_1 is the error term for each country. Detail of the macroeconomic variables used is summarized as below in Table 1.

Table 1: Description of variables

Sr. No.	Variables	Unit of measurement	Data sources	Expected outcome
1	GDP per capita	Current USD	World Development Indicator (WDI)	Dep.Variable
2	Unemployment	Rate	WDI	-
3	Inflation	Annual %	WDI	-
4	Government expenditure	% per year	WDI	+
5	FDI	% of GDP	WDI	+
7	Remittances	Current US\$	WDI	+

Source: Authors Own Calculation

Methodological Discussion

Firstly, the most important task is to determine the trend in the time series data to avoid spurious regression and Augmented Dickey-Fuller test (1984) test was employed for this reason. Ordinary Least Square (OLS) is the most appropriate technique when all the macroeconomic variables have the same order of integration at $I(0)$. If all the given variables have the order of integration $I(1)$ then co-integration approach will be suitable, as it is considerably simple model for the estimation. When order of integration of all selected macroeconomic variables is mixed, i.e, $I(0)$

and I(1) then Autoregressive Distributed Lag Model (ARDL) method developed by Persian et al (2001) will be applied.

At second step, lag selection criterion is the most important step in an econometric modeling. Once lag selection has been made, the next step is to apply Wald Test (F-statistics) to check the existence of LR relation between the dependent and independent variables. For the LR and SR estimation ARDL models are estimated for each selected country.

Augmented Dickey-Fuller test (ADF)

In 1984, the very same statisticians (David Dickey and Wayne Fuller) expanded their basic autoregressive unit root test (the Dickey-Fuller test).

$$y_t = c + \delta t + \phi y_t - 1 + \beta 1 \Delta y_t - 1 + \dots + \beta p \Delta y_t - p + \epsilon_t$$

$$\Delta y_t = \alpha + \beta t + \gamma y_t - 1 + \delta 1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \epsilon_t$$

Where,

- Δ is the differencing operator, such that $\Delta y_t = y_t - y_{t-1}$.
- The number of lagged difference terms, p , is user specified.
- ϵ_t is a mean zero innovation process.

Where c is constant, β the coefficient on a time trend and p the lag order of autoregressive process.

Unit root test carried out null and alternative hypothesis given as below:

Hypothesis

The null hypothesis of a unit root is

H0: $\phi=0$

Alternative hypothesis of the unit root,

H1: $\phi<0$

If the ADF test statistics is less than the critical value at 1% and 5% level of significance respectively then null hypothesis will be rejected.

Information Criteria via VAR Lag Order

Several selection criterion can be used in order to determine how many lags are required in a time series like as Akaike's information criterion (AIC) (Akaike 1973), Schwarz information criterion (SIC) (Schwarz 1978), Hannan-Quinn criterion (HQC) (Hannan and Quinn 1979), final prediction error (FPE) (Akaike 1969), and Bayesian information criterion (BIC) (Akaike 1979).

The basic information criteria are given by;

Akaike information criterion (AIC) = $-2(1/T) + 2(K/T)$

Schwarz criterion (SC) = $-2(1/T) + K \log(T)/T$

Hannan-Quinn criterion (HQ) = $-2(1/T) + 2K \log(\log(T))/T$

ARDL Bound test approach for LR relationships

Once lag selection has been made on the basis of any lag selection criterion, the next step is to apply Wald Test (F-statistics). The LR relationship among variables is necessary to be determined by Wald test. The Bound test approach had three validations. First, this test statistics is suitable for small or finite sample size. Second, bound test allows mixture of I(0) or I(1), the order of integration of appropriate variables (Pesaran *et al.* (2001). The existence of LR relationship may be found by the following unrestricted error correction regression model at an appropriate lag length. Similarly, rest of equations for all selected countries can be written as (Equation 3)

$$\Delta PCI = \sigma_0 + \sum_{t-j}^n \sigma_{1j} \Delta PCI_{t-j} + \sum_{t-j}^n \sigma_{2j} \Delta GEX_{t-j} + \sum_{t-j}^n \sigma_{3j} \Delta FDI_{t-j} + \sum_{t-j}^n \sigma_{4j} \Delta REMM_{t-j} + \sum_{t-j}^n \sigma_{5j} \Delta UNEM_{t-j} + \sum_{j=0}^p \alpha_{6j} \Delta INF_{t-j} + \alpha_0 PCI_{t-j} + \alpha_1 GEX_{t-j} + \alpha_2 FDI_{t-j} + \alpha_3 REMM_{t-j} + \alpha_4 UNEM_{t-j} + \alpha_5 INF_{t-j} + \mu 1_t \quad (3)$$

The Wald test or F-Statistics is followed for the existence of co-integration. The null hypothesis for no co-integration among variables is [$H_0: \alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$] (No evidence of LR relationships)

WB indicators in the LR

LR estimates of WB indicators were evaluated by using the following ARDL (m, n, o, p, q, and r) models.

$$PCI = d_0 + \sum_{j=1}^m d_1 PCI_{t-j} + \sum_{j=0}^n d_2 GEX_{t-j} + \sum_{j=0}^p d_3 FDI_{t-j} + \sum_{j=0}^q d_4 REMM_{t-j} + \sum_{j=0}^r d_5 UNEM_{t-j} + \sum_{j=0}^s d_6 INF + \mu 1_t \quad (4)$$

In the above Equation 4, d 's shows the LR elasticities.

WB indicators in the SR

After examining the LR estimates, short run coefficient can also be shown (Equation 5) by constructing an error correction model (ECM)

$$\Delta PCI = g_0 + \sum_{j=0}^r g_1 \Delta PCI_{t-j} + \sum_{j=1}^m g_2 \Delta GEX_{t-j} + \sum_{j=0}^n g_3 \Delta FDI_{t-j} + \sum_{j=0}^p g_4 \Delta REMM_{t-j} + \sum_{j=0}^q g_5 \Delta UNEM_{t-j} + \sum_{j=0}^r g_6 \Delta INF_{t-j} + \psi_1 ECM_{t-j} + \varepsilon_{1t} \quad (5)$$

In the above equations, Δ is first difference operator g 's are the short run elasticities and ψ 's are the speed of adjustment if with negative sign converges towards LR dynamics.

Results and Discussion

ADF test

Table 2 shows the detailed unit root results of all the given variables including both dependent as well as independent variables for Pakistan. All of the given variables are stationary at level except unemployment, FDI and remittances. Results of unit root test reveals that there is a mixture of I(0) or I(1).

Table 2: Unit root results of Pakistan

Variables	Test for Unit root in	Include in test equation	Lags	ADF Test statistics	Results
Inf	Level	Intercept	9	-3.21 (0.02)	I(0)**
Une	1 st difference	Intercept	9	-5.57 (0.00)	I(1)***
Pci	Level	Intercept	9	-4.15 (0.00)	I(0)***
Gex	Level	Intercept	9	-7.24 (0.00)	I(0)***
FDI	1 st difference	Intercept	9	-3.86 (0.00)	I(1)***
Remm	1 st difference	Trend & intercept	9	-4.54 (0.00)	I(1)***

*, **, *** shows critical values at 1, 5 and 10 percent level of significance
Test statistics are also given while probability values are given in brackets.

Table 3 represents the ADF test results from the perspective of India. Results shows that all of the given parameters are stationary at 1st difference except PCI, government expenditures (GEX) and INF (inflation). On the other side, unemployment (Une), foreign direct investment (FDI) and remittances (Remm) are stationary at 1st difference. Results reveals that there is a mixture of I(0) and I(1).

Table 3: Unit root results in case of India

Variables	Test for Unit root in	Include in test equation	Lags	ADF Test statistics	Results
Inf	Level	intercept	9	-3.64 (0.01)	I(0)**
Une	1 st difference	Intercept	9	-6.61 (0.00)	I(1)***
Pci	Level	Intercept	9	-4.27 (0.00)	I(0)***
Gex	Level	Intercept	8	-4.12 (0.00)	I(0)***
FDI	1 st difference	Intercept	8	-6.03 (0.00)	I(1)***
Remm	1 st difference	Intercept	8	-3.64 (0.00)	I(0)***

*, **, *** shows critical values at 1, 5 and 10 percent level of significance
Test statistics are also given while probability values are given in brackets.

Table 4 represents the results of ADF unit root test in case of Bangladesh. It shows that all of the given parameters are stationary at level except unemployment, FDI and remittances. While as, inflation, PCI and FDI are stationary at 1st difference.

Table 4: Unit root results in case of Bangladesh

Variables	Test for Unit root in	Include in test equation	Lags	ADF Test statistics	Results
Inf	Level	Intercept	9	-4.53 (0.00)	I(0)***
Une	1 st difference	Intercept	9	-5.92 (0.00)	I(1)***
Pci	Level	Intercept	9	-3.64 (0.00)	I(0)***
Gex	Level	Intercept	9	-3.54 (0.00)	I(0)***
FDI	1 st difference	Trend & intercept	9	-4.58 (0.00)	I(1)***
Remm	1 st difference	Intercept	9	-4.53 (0.00)	I(0)***

*, **, *** shows critical values at 1, 5 and 10 percent level of significance
Test statistics are also given while probability values are given in brackets.

Table 5: Bound Testing Approach in Selected Countries

Test Statistic	Value	K	Conclusion
F-statistic	5.19	5	Co-integration
F-statistic	4.69	5	Co-integration
F-statistic	3.85	5	Co-integration
Significance	I0 Bound	I1 Bound	
10%	2.26	3.35	
5%	2.62	3.79	
10%	3.41	4.68	

Note: K number of regressors. *, ** and *** certify that co-integration exists at 1, 5 and 10 percent level of significance

Var Lag Selection Criteria

Table 5 reports the Lag length selection based on AIC, SIC, HQC, FPE, and BIC. The minimum value of all lag selection criterion selects optimal 4 lags as allowed in annual data by

ARDL method. Test results proposed 4 suitable lag for the ARDL estimation in case of Pakistan and Bangladesh, 3 for India (details can be seen in Appendix I).

ARDL Bound Test

Following Table 5 confirms the LR relationship among selected models. From the perspective of all selected countries F-cal is greater than upper critical value. The calculated F-statistics is 5.19, 4.69 and 3.85, respectively in case of Pakistan, India and Bangladesh. So, bound test results in the favor of LR relationship.

ARDL Co-integration LR Results for Pakistan

ARDL LR results for Pakistan are given in Table 6. Inflation is found to be negatively related to PCI and have insignificant probability value. The coefficient value of inflation shows that a 1% increase in inflation would lead to decrease PCI by 0.24% on average in the LR. The justification may be that due to inflation consumers purchasing power falls consequently and the average standard of living decline. The findings of previous research studies Gerdtham and Johannesson (2001), Sanfey and Teksoz (2005), Blanchflower (2007), also showed negative relationship between inflation and WB.

With regard to GEX, it would have positive and significant impact on PCI in Pakistan. In the LR 1% increase in GEX would cause an increase in PCI by 0.21% on average. Finding of Abounoori and Asgarizadeh (2013) also revealed same results.

FDI would positively and insignificantly affect the PCI. Its insignificant could be attributed to perception of investors and law and order situation of a country which can directly affect the risk associated with investment. Positive relationship may be justified as Pakistan is a developing country so increase in foreigner's investment creates jobs and additional economic activities that benefits the local economy.

As expected unemployment has tendency to decrease PCI. It would decrease by 0.61% due to a 1% increase in unemployment in Pakistan. Agan et al. (2009) and Yuskina (2010) also found that there exist a negative relationship between unemployment or WB.

Remittances give positive impression on PCI with statistically insignificant coefficient value. The coefficient value is 0.05 signifying 0.05% increase in PCI due to a 1 % increase in remittances in the LR. The reason may be that remittances directly related to poor people income. Further, it has a great impact on their education, health and livelihood. The findings of Shahbaz and Aamir (2008) also consists that there exist a positive relationship between remittances and WB.

Table 6: ARDL LR results for Pakistan

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.24	0.05	-4.50	0.00***
GEX	0.21	0.08	2.56	0.03**
FDI	0.44	0.25	1.71	0.13
UNE	-0.61	0.21	-2.87	0.02**
REMM	0.05	0.06	0.83	0.42
C	2.92	1.45	2.00	0.08***

Source: Estimations of Study

Note: results are calculated using EViews-9. All variables in the log form.

ARDL Co-integration LR Results in India

ARDL LR results in case of India given in Table 7. The results showed that there exists a negative and insignificant relationship between inflation and PCI in India. The coefficient value of

inflation shows that a 1% increase in inflation would lead to decrease PCI by 0.02% on average in the LR. The justification may be that due to inflation consumers' purchasing power falls, and the average standard of living decline. The findings of previous research studies Sanfey and Teksoz (2005), and Blanchflower (2007), also showed negative relationship between inflation and WB.

With regard to GEX, it is having positive and significant impact on PCI in India. In the LR, 1% increase in GEX would cause an increase in PCI by 0.92%. This could be attributed to the welfare state that is usually measured through the share associated with public expenses in nationwide output. The findings of Abounoori and Asgarizadeh (2013) also revealed the same results.

FDI is positively and insignificantly affecting PCI. Positive relationship may be justified as India is a developing country, so increase in foreigner's investment creates jobs and additional economic activities that benefits the local economy.

As expected, unemployment has tendency to decrease PCI. It would decrease by 0.51% due to a 1% increase in unemployment in India. These results were consistent with the findings of Agan et al. (2009), and Yuskina (2010).

Remittances give positive impression on PCI in India with statistically highly significant coefficient value. The coefficient value is 0.81 signifying 0.8% increase in PCI due to a 1% increase in remittances. Positive relationship may be justified as remittances are directly related to peoples' income. Further, it has a significant impact on their education, health and livelihood. The findings of Shahbaz and Aamir (2008) were also consists with these results.

Table 7: ARDL LR Results in India

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEX	0.92	0.36	2.50	0.02**
REMM	0.81	0.40	1.99	0.00***
UNE	-0.51	1.24	-1.43	0.03**
FDI	0.65	0.47	1.38	0.18
INF	-0.02	0.11	-0.25	0.80
C	8.69	6.11	1.42	0.17

Source: Estimations of Study

Note: results are calculated using EViews-9. All variables in the log form.

ARDL Co-integration LR Results in Bangladesh

ARDL LR results for Bangladesh given in Table 8. Results showed that there exists a negative and insignificant relationship between inflation and PCI in Bangladesh. The coefficient value of inflation showed that a 1% increase in inflation would lead to decrease PCI by 0.01%. Due to inflation consumers' purchasing power falls and the average standard of living decline. The findings of previous research studies Di Tella et al. (2003), and Sanfey and Teksoz (2005), also showed the negative relationship between inflation and WB.

GEX could have positive and significant impact on PCI in Bangladesh. One percent increase in it could cause an increase of 0.09% in the LR. The finding of Abounoori and Asgarizadeh (2013) revealed that there exists a positive relationship between government expenditures and WB.

FDI is positively and significantly affecting PCI. The coefficient of FDI suggesting 0.79% increase in PCI due to 1% additional increase in FDI in Bangladesh. As Bangladesh is a developing country and increase in foreigners' investment would create jobs and additional economic activities that would benefits the local economy.

PCI would decrease by 0.46% due to a 1% increase in unemployment. Yuskina (2010) also found that there exist a negative relationship between unemployment and WB.

Remittances give positive impression on PCI in Bangladesh with statistically insignificant coefficient value. The coefficient value is 0.08, signifying 0.08% increase in PCI due to a 1 % increase in remittances in the LR. So, better health and education could increase e efficiency increase of people and they will be able to earn more. Findings of Shahbaz and Aamir (2008) also found positive relationship between remittances and WB.

Table 8: ARDL LR Results in Bangladesh

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REMM	0.08	0.06	1.27	0.25
GEX	0.09	0.02	3.34	0.02**
FDI	0.79	0.32	8.46	0.00***
INF	-0.01	0.04	-0.39	0.70
UNE	-0.46	0.18	-2.56	0.05**
C	2.74	0.26	10.52	0.00***

Source: Estimations of Study

Note: results are calculated using EViews-9. All variables in the log form.

ARDL Co-integration SR Results

Table 9 discusses the short run results using vector ECM results for Pakistan. The most important thing in the short run results is actually speed of adjustment term. It shows that how much time would be taken by the economy to restore LR equilibrium. Negative indication of speed of adjustment term shows that the economy will converge towards LR equilibrium. SR results are also consistent with the LR results. The significance of coefficient of lagged error correction term with negative sign confirms convergence towards LR equilibrium. ECM is negative as well as statistically significant shows that an economy converge to LR equilibrium by taking 13% adjustment each year.

Table 9: ARDL SR results in Pakistan

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINF	-0.03	0.04	-0.73	0.48
DGEX	0.08	0.14	-0.59	0.56
DFDI	1.92	0.46	4.11	0.00***
DUNE	-0.42	0.09	-4.67	0.02**
DREMM	1.26	0.23	5.40	0.00***
ECM(-1)	-0.13	0.06	-2.16	0.00***

Source: Estimation of the study

Note: D indicate difference of regressors.

Table 10 shows that in the ARDL SR results for India. Here, GEX, remittances and FDI are positively correlated with PCI. ECM term has negative sign that shows model convergence towards LR equilibrium. This value is negative as well as statistically significant which shows economy is converging to LR equilibrium by taking 11 % adjustment each year.

Table 10: ARDL SR results for India

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEX)	1.24	0.52	2.34	0.03**
D(REMM)	2.36	1.07	2.20	0.04**
D(UNE)	-5.85	1.63	-3.58	0.00***
D(FDI)	0.88	0.64	1.37	0.18
D(CPI)	0.20	0.12	1.67	0.11
CointEq(-1)	-0.11	0.018	-6.11	0.00***

Source: Estimation of the study

Note: D indicate difference of regressors.

Table 11 represents the SR results in case of Bangladesh. Significant coefficient of lagged ECM term with negative sign confirms convergence towards LR equilibrium by taking 5.8 % adjustment each year.

Table 11: ARDL SR results for Bangladesh

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PCI)	3.35	1.33	2.51	0.05**
D(REMM)	2.36	0.83	2.84	0.03**
D(GEX)	0.47	0.17	2.66	0.04**
D(FDI)	-1.47	1.22	-1.20	0.28
D(CPI)	0.29	0.13	2.15	0.08***
D(UNE)	-2.36	1.18	-1.99	0.10***
CointEq(-1)	-0.058	0.22	-2.63	0.02**

Source: Estimation of the study

Note: D indicate difference of regressors.

Conclusion

Study results also showed that remittances has a greater influence on PCI in case of India. The results are quite obvious. While as, remittances has very little influence on PCI in Pakistan as compare to other countries India and Bangladesh. Study results also derived that the rate of inflation has a lower impact on PCI both in India and Bangladesh as compare to Pakistan. While FDI has a greater coefficient value in case of Bangladesh. This means that FDI has greater influence on PCI in Bangladesh as compare to and India and Pakistan.

GX showed less influence on PCI for the both countries Pakistan and Bangladesh. Remittances and GEX findings are favorable for India as compare to Pakistan and Bangladesh. In case of India, unemployment and inflation are lower than Pakistan and greater than Bangladesh. Results of unemployment and inflation rate are not much clear for India as compare to Pakistan. Results are clearly given in table 13 as below. Short run results were matched with the LR results. Vector ECM value was negative and significant for all selected nations.

It can be suggested that government should provide proper availability of infrastructure, improve human resources and provide suitable macroeconomic environment. All these incentives may positively and significantly contribute to FDI inflows. For the perspective of remittances there should be tax incentive and proper mechanisms for migrants. To reduce unemployment there should

be more investment in human capital, like, education and training. Overall results of the study confirmed the significant relation between selected macroeconomic variables and WB.

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Appendix I: Lag selection criterion

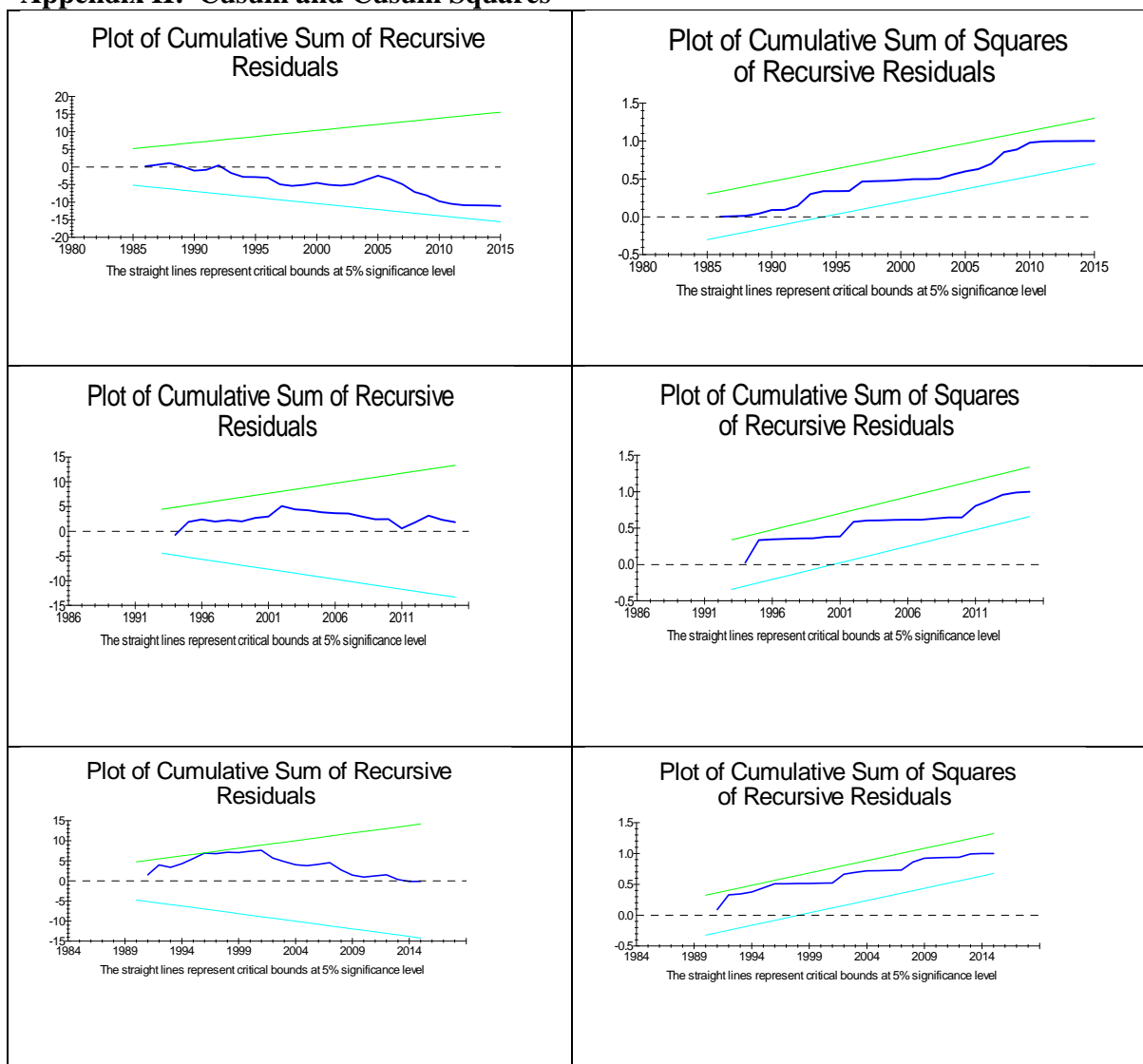
Lag	LogL	LR	FPE	AIC	SC	HQ
Pakistan						
0	-388.98	NA	2119.96	24.68	24.96	24.77
1	-278.47	172.66	21.01	20.02	21.95	20.66
2	-224.55	64.02*	8.85	18.90	22.48	20.09
3	-179.68	36.46	11.06	18.35	23.57	20.08
4	-66.24	49.62	0.73	13.51*	20.38*	15.79*
India						
0	-220.97	NA	0.15	15.13	15.41	15.22
1	-143.29	119.11	0.00	12.35	14.31*	12.98
2	-108.11	39.87	0.014	12.40	16.05	13.57

3	-25.50	60.57*	0.00*	9.30*	14.62	11.00*
Bangladesh						
0	-293.24	NA	5.34	18.70	18.97	18.79
1	-200.72	144.56	0.16	15.17	17.09	15.80
2	-177.66	27.38	0.47	15.97	19.55	17.16
3	-136.42	33.51	0.74	15.65	20.87	17.38
4	-11.33	54.72*	0.02*	10.08*	16.95*	12.36*

* indicates lag order selected by the criterion

* indicates lag order selected by the criterion

Appendix II: Cusum and Cusum Squares



Source: Using Microfit 4.1, Cusum and Cusum Squares results are calculated

Appendix III: Summary table of the most alternative indicators of GDP

Indicator	Main features	Assessment
Gross Domestic Product (GDP)	Define both total economic output or total demand	<ul style="list-style-type: none"> ▲ Used as an indicator of economic size ▲ Larger GDP would certainly mean a larger output GDP used as economic growth or progress metric ▼ Not measure an individual WB or wealth ▼ GDP framework cannot tell us whether final goods or services produced during a particular period ▼ Other aspects like as environmental, health quality and personal satisfaction totally neglected.
GDP per capita	GDP as well as population	<ul style="list-style-type: none"> ▲ The larger the population of a country, the more likely it will have an especially large GDP ▲ so, GDP per capita mostly used as average per person income ▲ Tells about the overall wealth of income ▲ Used as a proxy of country's standard of living ▲ It is calculated most commonly used term international currency united states (US\$) ▲ Easily calculated from available data of GDP or country population estimates ▲ Allows for countries comparisons ▼ Does not take in account what the money is spent on ▼ Comparison of GDP per capita over time needed to take in account change in prices mean adjusted inflation ▼ When compare the living standard of two countries based on purchasing power parity (PPP) which reflect the difference what people are able buy from their income
Adjusting GDP		
Genuine progress indicator (GPI) (<i>redefining progress US</i>)	Corrects GDP by a series of monetised environmental and social factors	<ul style="list-style-type: none"> ▲ Attempt to measure real increase in economic welfare ▲ Comprehensible to general public ▲ Allowing long term trends and backward-looking ▲ Used as a comparison of different countries ▲ Difficulties with monetising social or environmental aspects ▼ Non-economic variables like as leisure environment are very subjective an also difficult to assign an economic value ▼ Not useful for judging state of business cycle.
Replacing GDP		
Human Development Index (HDI) (<i>United Nation Development Programme</i>)	Association between traditional GDP data to social indicators	<ul style="list-style-type: none"> ▲ Recognize the importance of economic measurements and also integrates the complementary informations with GDP data set ▲ Widely used over the worldwide ▲ Easily understandable "ranking" mechanism ▲ Further, results comparable with other countries ▼ Same limitation of GDP ▼ Sustainability issue also exist ▼ Other human development, civil and political aspects totally neglected ▼ Measurement error or incomplete data issues in developing countries

Note: ▲ Strengths ▼ Weakness

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