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STOCK MARKET AND BANKING SECTOR: ARE THEY COMPLEMENTARY FOR ECONOMIC GROWTH IN LOW HUMAN DEVELOPED ECONOMY?

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Abstract. In this study, the impact of stock market and banking sector development on economic growth is investigated by applying mean and common mean group estimators on the sample from 1989 to 2013 for low human developed countries. The empirical findings represent that among the proxies of banking sector development only credit to private sector leaves positive and significant effect on economic growth in case when it interacts with all the three proxies of stock market development. However, traded stocks and turnover ratio are significantly enhancing economic growth in case when these interact with banking sector development. This study also finds that both stock market and banking sector development are together required to increase economic growth in low human developed countries. This study also confirms the evidence of Lewis (1954) model for the selected countries. Lastly, this study proposes that credit to private sector from banking sector development in the light of stock market development must be given prime importance if economic growth is to be targeted in low human developed countries.

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I. INTRODUCTION

The importance of economic growth cannot be underestimated as it entails many welfare maximizing consequences. But what determines the rate of economic growth remains a debatable point. Variety of factors has been identified by the researchers¹ but the debate is still far away from settlement. The factors identified are very much conspicuous in Harrod – Domar model, Solow model and endogenous growth model. One of such indicators identified is financial development. Although, the relationship between financial development and economic growth has been in the discussion from the past many years and researchers have been contributing in the academic literature by empirically exploring this relationship, yet the debate is unsettled that whether development of financial sector causes economic growth or it is growth process which leads to the development of financial sector.

The importance of well-developed financial system to achieve economic growth can be traced back in the Schumpeter (1911), Gurely and Shaw (1955) and Shaw (1973). The debate of growth-finance is then further divided into bank based and market based. Here enters the debate of complementarity and/or substitutability. As while talking about the financial intermediation one cannot set aside either market based or bank based system. So the researchers started to take into account both the markets. The association between financial market development and economic growth then moved in the arena of causality which demands the delineation that which causes which. Thus, another much debated question emerges that whether finance growth nexus is demand following or supply leading. The literature suggests that if causal relationship runs from economic growth to development of financial sector then this will be named as demand following hypothesis, however, if the causal

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¹ Mankiw *et al.* (1992), Sala-I-Martin (1997), Bernanke and Gurkaynak (2001), Hendry and Krolzig (2004).

relationship runs from financial development to economic growth then it will be called as supply leading hypothesis.

Besides this, the relationship between output growth and financial development may also be bidirectional which shows that if financial development accelerates economic growth then resultantly economic growth will also expand financial sector development in any economy. Another important aspect of finance and growth relation is the impact of composite term of stock market development and banking sector development (both together represents financial development) on economic growth. This reveals that whether both sectors are complementary and hence are required together to elevate economic growth or this relationship will show that both sectors are substitutes to each other. This will conclude that at one time only one sector is to be focused to enhance economic growth. In an empirical study, Cheng (2012) instead of using multiplicative interaction term, the author uses debt-to-equity ratio to explore the link between credit and equity markets. The author is of the view that an economy's development accompanied by the increase of debt-to-equity ratio confirms whether two sources of finance are complementary to each other on not? The study concludes that in Taiwan the two sources are substitutes. Therefore, the present study introduces interaction term between stock market and banking sector development to investigate the joint effect of interaction term on economic growth and this will enable us to differentiate whether both sectors are complementary or substitutes to each other for promoting economic growth in low human developed countries classified in Human Development Report of UNDP (2013).

Therefore, the present study aims to investigate the impact of financial development in the form of both banking sector and stock market development on economic growth in low human developed countries using mean and common mean group estimators. This study will also capture the effect of interaction term between stock market and banking sector development on economic growth to see whether both sectors should be taken together to promote economic growth or should they be taken separately?

The remaining study will be carried out by discussing review of the past studies in the part -2. In part -3, data sources, models and

estimation procedure will be presented. Afterwards, empirical results and their discussion will be discussed in part -4. In the last and final part -5, based on the findings of the study, conclusion and possible policy implications will be presented.

II. REVIEW OF LITERATURE

THE IMPACT OF BANKING SECTOR DEVELOPMENT ON ECONOMIC GROWTH

The effect of banking sector development on economic growth has been empirically tested by many researchers. The studies which capture the effect of banking sector development on economic growth are presented as below:

We start from the study of Moustain (2004) who after employing Johansen multivariate cointegration and Granger causality tests on sample period from 1970 to 2000 for Moroccan economy found absence of long run relationship between financial development and economic growth in Morocco. Moreover, the estimates of causality test for short run suggested that out of three proxies of banking sector development only domestic credit to private sector causes economic growth in Morocco. The study concluded that banking sector development was witnessed to be irrelevant for economic growth in Morocco. Khan *et al.* (2005) after using ARDL bounds testing technique on the sample period from 1971 to 2004, this study found that financial depth, real deposit rate and financial reforms have positive and significant impact on economic growth only in the long run in Pakistan.

Apergis *et al.* (2007) after applying panel causality test on sample period from 1975 to 2000 tested the impact of financial development on economic growth for 15 selected OECD and 50 selected non OECD countries (total 65 countries) and confirmed that proxies of financial development such as liquid liabilities, domestic credit to private sector and domestic credit provided by the banks to private sector have bidirectional causal relationship with economic growth in these selected countries. Afterwards, Perera and Paudel (2009) used Johansen multivariate cointegration and Granger causality tests on sample period from 1955 to 2005 and found unidirectional causality running from economic growth to narrow money, total credit and private sector credit

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as share of total credit and from private sector credit as share of per capita nominal GDP to economic growth. The findings also confirmed bidirectional causal relationship between broad money supply and economic growth for Sri Lanka. This study confirmed evidence of demand following phenomenon for Sri Lanka. In another study Hassan et al. (2011) considering 168 low and middle income countries investigated the effects of different proxies of financial development like domestic credit to the private sector, domestic credit provided by the banks, liquid liabilities and savings on economic growth using sample period from 1980 to 2007. The empirical results confirmed evidence of bidirectional causal relationship between economic growth and financial development in most of the regions but, in the two poorest regions unidirectional causality was found from economic growth to financial development. This study concluded that financial development may be a necessary condition for accelerating economic growth rather than sufficient condition

Okwo *et al.* (2012) considering M2 and domestic credit to private sector as proxies of financial sector development used least square regression and Granger causality tests on the sample from 1986 to 2010 and found that both measures of financial development may be important for strengthening financial development but these measures did not promote economic growth in Nigeria. Adu *et al.* (2013) using ARDL bounds testing approach on the sample period from 1961 to 2010 and confirmed long run relationship between financial development and economic growth in Ghana. Adusei (2013) after using GMM dynamic panel technique on the data series from 1981 to 2010 for 24 selected African countries concluded that domestic credit to private sector and liquid liabilities have significant and positive impact on economic growth in the selected African countries. The findings further concluded bidirectional causal relationship between measures of financial development and economic growth in the selected countries.

The study by Malki and Assaf (2014) using ARDL cointegration for the period from 1970 to 2008 and found that financial development in the form of bank deposit liabilities and credit to private sector has positive and significant effect on economic growth in the long run but, only bank deposit liabilities were leaving positive and significant effect on economic growth in the short run in Saudi Arabia. This study also provided evidence of unidirectional causality running from credit to private sector to economic growth both in short and long run. Petkovski and Kjosevski (2014) applied GMM dynamic panel technique on the sample period from 1991 to 2011 on 16 transition countries from Central and South Eastern Europe. This study considered credit to private sector, interest margin and ratio of quasi money as proxies for banking sector development and found that ratio of quasi money was leaving positive and significant effect on output growth but, credit to private sector left negative and significant effect on economic growth in the selected 16 countries. The findings further showed that inflation is significantly increasing economic growth in one specification out of three specifications for the selected sample.

THE IMPACT OF STOCK MARKET DEVELOPMENT ON ECONOMIC GROWTH

Levine and Zervos (1998) after using regression analysis on the sample period from 1976 to 1993 for the selected 41 countries of the world found that stock market development had strong, significant and positive impact on economic growth and concluded that development of stock market was more effective indicator for accounting economic growth. Alajekwu et al. (2013) considered market capitalization, value of traded stocks and turnover ratio as proxies for stock market development and applied causality test on time series data from 1986 to 2011 for Nigerian economy and concluded that stock market development do not have significant impact on economic growth in Nigeria. Omoniyi et al. (2014) used market capitalization and turnover ratio to represent stock market development to examine the impact of stock market development on economic growth for Nigerian economy. After using regression analysis, the results concluded that Nigerian stock market is not matured enough to accelerate economic growth. Victor et al. (2015) considered four measures such as market capitalization, number of deals, all share index and total value of market transactions for representing stock market development to capture the effect of stock market on economic growth for Nigeria. After employing Johansen cointegration approach on the data from 1993 to 2013, this study found negative and significant effect of market capitalization on economic growth whereas the remaining proxies left positive and significant effect on economic growth. These findings were not robust to various diagnostic tests.

THE IMPACT OF BANKING SECTOR AND STOCK MARKET DEVELOPMENT ON ECONOMIC GROWTH

Rousseau and Wachtel (2000) after applying Difference GMM for the sample from 1980 to 1995 on the 47 selected countries of the world tested the impact of stock market and banking sector development on economic growth. By using market capitalization and value of traded stock as proxies for stock market and M3 as share of GDP and M3 as share of total population as proxies for banking sector development, the results concluded that market capitalization as share of total population and value traded along with real liquid liabilities as share of total population (M3) were significantly stimulating economic growth. However, the effect of value traded on output or economic growth was found to be stronger than that of the effect of market capitalization on output.

Yay and Oktaver (2009) after using difference GMM technique on five years averaged data from 1975 to 2006 for 37 countries (out of which 16 countries were developed and 21 were developing) and concluded that both banking and stock market development were significantly improving economic growth in all the 21 developing countries whereas, only stock market development was found in accelerating economic growth in all the 16 developed countries selected in this study. Khadraoui and Smida (2012) considered private sector credit, M3, market capitalization, financial system assets and credit deposit ratio as proxies for financial development for 70 selected developed and developing economies to capture the effect of financial development on economic growth. After applying fixed effect, difference GMM and system GMM techniques on the five years averaged data from 1970 to 2009, the results estimated using difference and system GMM techniques represent that all the proxies of financial development exerted positive and significant impact on economic growth in all the specifications whereas, the estimates of fixed effect model disclosed that all the measures of financial development were significantly enhancing economic growth except credit to deposit ratio.

Rahimzadeh (2012) took market capitalization, value of traded shares and turnover ratio as proxies for stock market development and domestic credit to private sector as proxy for banking sector development 11 selected countries of Middle East and North Africa to explore the effects of stock market and banking sector development on economic growth. After applying panel co-integration and random effect models on the data series from 1990 to 2011, this study concluded that stock market did not affect economic growth whereas, only banking sector development was found in accelerating economic growth in selected countries of Middle East and North Africa. Chaudhry et al. (2012) used broad money supply, credit to private sector and market capitalization to capture the effect of financial development on economic growth for Pakistan. After using Engle Grange based cointegration method and error correction model on the data series from 1972 to 2006, this study found that both broad money supply and credit to private sector were significantly increasing economic growth in short run. In an equation when market capitalization regressed with broad money supply both were significantly increasing economic growth but in an equation when market capitalization is regressed with credit to private sector then only market capitalization was significantly increasing economic growth in Pakistan.

Awan and Iftekhar (2015) considered market capitalization, stock traded value and stock turnover ratio as proxies for stock market development and M2 as proxy for banking sector development or financial intermediation. After applying ordinary least square regression and Granger causality test on the sample period from 1988 to 2012, this study found positive and significant effect of traded stock on economic growth and negative and significant effect of M2 on economic growth in Pakistan. The results further provided evidence of unidirectional causal relationship running from market capitalization to economic growth and bidirectional causal relationship between economic growth and M2 for Pakistan.

After discussing literature on the relationship between stock market, banking sector development and economic growth. Now we present data source, model and methodology in the next part -3 which is given as below:

III. DATA SOURCE, MODEL AND METHODOLOGY

The detail of this part is presented as below:

DATA SOURCE

The data for all the variables such as market capitalization, stock traded, turnover ratio, domestic credit to private sector, money supply, remittances, consumer price index, urban and rural populations has been obtained for the period from 1989 to 2013 from World Development Indicators (2015), World Bank² for the 10 low human developed countries [Bangladesh, Cote d'Ivore, Kenya, Nigeria, Pakistan, Papua New Guinea, Tanzania, Uganda, Zambia and Zimbabwe]. These countries have been selected on the basis of the value of human development index proposed in Human Development Report of UNDP (2013).

MODEL OF THE STUDY

In this study we have conceptualized six models for each low human developed countries using double logged transformation approach as results through double logged transformation are more efficient and consistent [Ehrlich (1977), Bowers and Pierce (1975), Layson (1983), Cameron (1994) and Ehrlich (1996)]. The conceptualized functional forms of the models are proposed as below:

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LGDP = f[LMC, LBMS, LCPI, LREM, LMIG, LMC x LBMS]
LGDP = f[LMC, LDCTPS, LCPI, LREM, LMIG, LMC x LDCTPS]
LGDP = f[LST, LBMS, LCPI, LREM, LMIG, LST x LBMS]
LGDP = f[LST, LDCTPS, LCPI, LREM, LMIG, LST x LDCTPS]
LGDP = f[LST, LDCTPS, LCPI, LREM, LMIG, LST x LDCTPS]
LGDP = f[LTURNRA, LBMS, LCPI, LREM, LMIG, LTURNRA x LBMS]
(5)
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²http://data.worldbank.org/data-catalog/world-development-indicators

(6)

LGDP = f [LTURNRA, LDCTPS, LCPI, LREM, LMIG, LTURNRA x LDCTPS]

Whereas;

TABLE 1

Construction and Description of the Variables

Variable Representation	Variable Composition	Name of the Variables	Proxy For	Variable Description
LGDP	ln (GDP)	Gross domestic Economic product Growth		This variable has been obtained from World Development Indicators (CD – ROM 2015) in constant dollar form.
LMC	ln (MC / GDP)	Market capitalization as share of gross domestic product	Stock	This variable has been obtained by taking the ratio of market capitalization to gross domestic product.
LST	ln (ST / GDP)	Stock traded as share of gross domestic product	Market Development (SMD)	This variable has been composed by taking the ratio of total traded stocks to gross domestic product.
LTURNRA	ln (TURNRA)	Turnover ratio	(5112)	This variable has been constructed by taking the ratio of market capitalization to the traded stocks
LBMS	ln (BMS / GDP)	Broad money supply as share of GDP	Banking	This variable has been estimated by dividing M2 on gross domestic product.
LDCTPS	ln (DCTPS / GDP)	Domestic credit provided to private sector as share of GDP	Development (BSD)	After dividing domestic credit to private sector on gross domestic product, we obtain this variable.
LBSD x LSMD	ln (BSD) x ln (SMD)	Proxy specific inter both banking sect market devel	action term of or and stock opment	This variable will be obtained by multiplying each proxy of stock market development with the each proxy of banking sector development.
LCPI	ln (CPI)	Consumer Price Index	Control Variable	This variable was directly obtained from world development indicators.
LREM	ln (REM / GDP)	Net inflows of remittances as share of gross domestic product	Control Variable	This variable has been taken after dividing net inflows of remittances on gross domestic product.
LMIG	ln (URBPOP / RURPOP)	Internal or domestic migration	Control Variable	This variable has been developed by taking the ratio of urban population to rural population.

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As all the proxies of both banking sector development and stock market development are expected to have positive impact on economic growth so the objective of the estimation is to analyze which one of them is more elastic and whether the selected pair of proxies are complement or substitutes to each other in terms of their marginal impact on the GDP. The structure of the model is given as below:

METHODOLOGY FRAMEWORK

As we have obtained a large sample in terms of time and cross sections which will imply that the assumption 2 of OLS "X values are fixed in repeated sampling" might be violated [Gujrati (2012)], therefore, we will initiate our analysis from estimating unit root problem by using LLC (2002), IPS (2003), Fisher ADF and Fisher Phillip Perron [extracted from Maddala and Wu (1999) and Choi (2001)] unit root tests which will check whether weak version of assumption 2 is fulfilled. If there will be evidence of unit root then mean and variance of the variables will not be constant i.e. violation of assumption 2^3 . Afterwards we would also apply Pesaran CIPS (2007) unit root test for checking whether there prevails any cross-sectional dependence. Afterwards, we will employ Kao (1999) and Pedroni (2004) panel cointegration tests from the first generation panel cointegration models and Westerlund (2007) panel cointegration test from second generation panel cointegration model for investigating long run cointegration between economic growth and financial development in the form of banking sector development and stock market development considering inflation, inflow of remittances and internal migration as control variables^{4,5}. In the next step, we will find out marginal impact of each factor on economic growth using mean group [Pesaran and Ron (1995)] and common mean group [Pesaran (2006)]

³ The strong version of the assumption was that the distribution of the series must be constant, since we do not have population data to check this, hence we usually check the weak version which states that if the mean and variance of the series are constant then it will mean that it can be expected that the distribution is same means, it is weak or covariance stationary [Johnston and DiNardo (2000)].

⁴ First generation cointegration tests are based on assumption that the cross sections are independent

⁵ Second generation cointegration tests are applicable even if the cross sections are dependent

estimators. The speed of convergence will be tested by using error correction specification. The results will be filtered using various diagnostic tests such as time series hetroskedasticity developed by Breusch and Pagan (1979) for the efficiency of the model, first order time series autocorrelation for the validity of the model⁶, cross-sectional dependence test developed by Pesaran (2004) for the validity of the model and Pesaran (2007) CIPS unit root test of residuals to check the spuriousness of the estimates.

IV. RESULTS AND DISCUSSION

The descriptive statistics Table – 2 shows some basic statistics for each of the variable used in the estimation process. Other than natural log of traded stocks (lnST), natural log of turnover ratio (lnTURNRA) and natural of remittances (lnREMIT), all other variables have mean larger than their standard deviation which means that all variables are under dispersed (dispersion is smaller than the mean value) while the three mentioned variables are over dispersed (dispersion is larger than the mean value). This shows that for our selected countries these three mentioned variables are highly different from each other while other variables resemble each other because of the fact that these countries are from same group. The mean values of the proxies of stock market development such as (lnMC, lnST, lnTURNRA) and proxies of banking sector development such as (lnBMS, lnDCTPS) will be used later for the interpretation of the composite terms.

The Kurtosis value of the variables like lnTURNRA and lnDCTPS is almost equal to 3 while others show that there are either too many (kurtosis > 3) or too few (kurtosis < 3) outliers in the data as compared to a normal distribution thus indicating cross sectional hetroskedasticity. This means that any theoretical model developed from this data should not be estimated using pooled OLS which assumes that all the cross sections are same in each and every aspect. The results of variance inflation matrix are presented in Table - 4.2, which show that the calculated values of VIF for all independent variables are less than 10

⁶ First order autocorrelation testing using AR(1) model of residuals [Gujrati (2012)].

hence it is concluded that there is no evidence of multicollinearity problem in low human developed countries.

TABLE 2

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
lnGDP	23.53	23.30	25.90	21.83	1.10	0.51	2.02
lnMC	2.41	2.42	6.19	-0.60	1.34	-0.08	2.61
lnST	-0.79	-1.05	4.86	-5.74	2.12	0.48	2.65
InTURNRA	1.42	1.23	6.21	-2.17	1.74	0.50	3.22
lnBMS	3.36	3.36	5.02	1.99	0.43	-0.16	3.68
InDCTPS	2.82	2.85	4.64	0.46	0.64	-0.63	3.26
lnMIG	3.60	3.67	4.69	2.44	0.60	-0.22	1.89
InREMIT	-0.26	-0.02	2.72	-5.61	1.94	-0.62	2.51
lnCPI	3.55	4.23	5.41	-4.28	1.98	-2.31	8.03

Descriptive Statistics

After discussing the estimates of variance inflation factor, the estimates of unit root test are going to be discussed. Five types of panel unit root tests (such as LLC, Breitung, IPS, Fisher ADF and Fisher Phillip – Perron) are applied with intercept configuration on natural log of gross domestic product, natural log of market capitalization, natural log of stock traded, natural log of turnover ratio, natural log of broad money supply, natural log of domestic credit to private sector, natural log of migration, natural log of remittances and natural log of consumer price index both at level and at first difference. The null hypothesis of LLC unit root test suggests that panel series is nonstationary and alternative hypothesis states that panel series is stationary. At level we accept null hypothesis for natural logs of GDP, broad money supply, domestic credit to private sector and remittances and we accept alternative hypothesis for the remaining series. When all these variables are tested for first difference then we accept alternative hypothesis and conclude that all the variables are stationary at first difference according to LLC unit root test. Moreover, Breitung unit root test follows the same null and alternative hypotheses as LLC unit root test follows. According to Breitung unit root test, all panel series are nonstationary but only natural log of stock traded and natural log of migration are witnessed to be stationary at level but all the selected variables are stationary at first difference.

Afterwards, the null hypothesis of all panel series contain unit root suggested by IPS unit root test is tested against its alternative hypothesis of some panel series are stationary. The results confirm that all the panel series are nonstationary except natural log of stock traded at level whereas at first difference all the panel series are stationary. Besides this two further unit root tests are applied Fisher ADF and Fisher Phillip -Perron. These tests follow the same null and alternative hypotheses and the null hypothesis states that panel series are nonstationary whereas alternative hypothesis states that at least one panel series is stationary. The results confirmed that all the panel series are nonstationary at level except natural logs of turnover ratio and consumer price index according to Fisher ADF unit root test whereas according to Fisher Phillip – Perron unit root test all panel series are nonstationary at level except natural logs of turnover ratio, remittances and consumer price index. However, according to the estimates of Fisher ADF and Fisher Phillip – Perron unit root tests all the panel series become stationary at first difference. On the basis of the results of various unit root test, we may conclude that panel series taken in this study follow mixed order of integration as some variables are stationary at level and some are stationary at first difference. The results are reported in the Table -3 and Table -4 as below:

TABLE	3
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Variance of Inflation Factor (VIF) Matrix

	lnGDP	lnMC	lnST	InTURNRA	lnBMS	lnDCTPS	lnMIG	InREMIT	lnCPI
lnGDP	-								
lnMC	1.00	_							
lnST	1.30	1.40	-						
InTURNRA	1.68	1.00	2.73	-					
lnBMS	1.13	1.56	1.76	1.20	-				
InDCTPS	1.12	1.46	1.62	1.15	3.04	-			
lnMIG	1.28	1.04	1.23	1.19	1.02	1.04	_		

	lnGDP	lnMC	lnST	InTURNRA	lnBMS	lnDCTPS	lnMIG	InREMIT	lnCPI
InREMIT	1.31	1.10	1.01	1.09	1.00	1.00	1.00	-	
lnCPI	1.11	1.01	1.00	1.00	1.01	1.01	1.02	1.52	_

TABLE 4

Unit Root Test

Unit Root Test At Level									
Variables	LLC	Breitung	IPS	ADF	PP				
lnGDP	6.42 (1.00)	0.48 (0.68)	8.86 (1.00)	2.34 (1.00)	1.79 (1.00)				
lnMC	-1.47 (0.07)	-0.18 (0.43)	-0.82 (0.20)	22.56 (0.26)	20.59 (0.42)				
lnST	-2.3 (0.01)	-1.5 (0.09)	-1.43 (0.07)	27.68 (0.12)	36.13 (0.11)				
InTURNRA	-3.61 (0.00)	0.46 (0.67)	3.87 (0.10)	2.62 (0.08)	52.61 (0.00)				
lnBMS	-0.80 (0.21)	0.30 (0.62)	-0.05 (0.47)	18.83 (0.47)	15.18 (0.76)				
lnDCTPS	0.73 (0.76)	1.20 (0.88)	0.29 (0.61)	25.75 (0.17)	23.83 (0.24)				
lnMIG	-15.52 (0.00)	-1.33 (0.09)	-0.799 (0.21)	27.87 (0.11)	28.50 (0.10)				
lnREMIT	0.24 (0.59)	2.20 (0.98)	0.72 (0.77)	23.73 (0.25)	35.74 (0.02)				
lnCPI	-1.56 (0.05)	2.68 (0.99)	-0.37 (0.35)	33.18 (0.03)	58.25 (0.00)				
		Unit Root Tests	At First Difference	2					
ΔlnGDP	-1.84 (0.03)	-1.29 (0.09)	-2.97 (0.00)	79.76 (0.00)	76.99 (0.00)				
ΔlnMC	-2.68 (0.00)	-2.01 (0.02)	-11.79 (0.00)	55.87 (0.00)	288.2 (0.00)				
∆lnST	-13.66 (0.00)	-3.08 (0.00)	-11.99 (0.00)	40.50 (0.00)	341.7 (0.00)				
∆lnTURNRA		-	-11.59 (0.00)	48.95 (0.00)	422.6 (0.00)				
∆lnBMS	-9.47 (0.00)	-1.82 (0.03)	-10.44 (0.00)	38.93 (0.01)	199.4 (0.00)				
ΔlnDCTPS	-11.04 (0.00)	-4.77 (0.00)	-10.62 (0.00)	62.66 (0.00)	219.6 (0.00)				
ΔlnMIG	-2.33 (0.01)	-1.36 (0.08)	-2.37 (0.01)	189.1 (0.00)	92.20 (0.00)				
ΔlnREMIT	-8.26 (0.00)	-1.43 (0.07)	-9.93 (0.00)	86.60 (0.00)	286.6 (0.00)				
ΔlnCPI	-4.08 (0.00	-1.55 (0.06)	-4.56 (0.00)	57.83 (0.00)	85.79 (0.00)				

Note: Values reported in () are the probability values.

After discussing the order of integration of the panel series, now the long run relationship between stock market, banking sector development and economic growth along with some other control variables is tested. Three types of panel cointegration tests such as Kao Panel Cointegration Test, Pedroni Panel Cointegration Test and Westerlund Error Corrected Based Panel Cointegration Test are applied. The results reported in Table -5 confirm that for the models of market capitalization and broad money supply and stock traded and broad money supply, for each case one indicator from Westerlund test reveal presence of cointegration. The results are presented in the following Table -5:

TABLE 5

Model of Low Human Developed Countries											
		Dependent Variable: InGDP			Control Variable: lnCPI, lnMigratio n						
Cointegration	Models	lnMC +	lnST +	InTURNRA	lnMC +	lnST +	InTURNRA				
Test		lnBMS	lnBMS	+ lnBMS	InDCTPS	InDCTPS	+ lnDCTPS				
		Al	ternative Hypo	thesis: Cointegr	ation is Presen	t					
Kao	t	-0.10	0.07	-0.33 (0.36)	-1.37	-1.58	1.62 (0.05)				
Rao	ι	(0.45)	(0.47)	-0.55 (0.50)	(0.08)	(0.06)	1.02 (0.05)				
		Alternative Hypothesis : Cointegration with Common AR Coefficients									
	Pv	0.63	-0.07	0.12(0.45)	-0.91	-1.25	-0.38 (0.64)				
	1,	(0.74)	(0.53)	0.12 (0.45)	(0.92)	(0.68)	0.50 (0.04)				
	Prho	2.57	1.99	1 63 (0.95)	2.73	2.91	1.81 (0.96)				
	1110	(0.99)	(0.98)	1.05 (0.95)	(0.99)	(0.98)	1.01 (0.90)				
Pedroni	Pnn	1.60	0.38	-0.23(0.41)	1.93	1.94	-0.12(0.45)				
	- PP	(0.94)	(0.65)	-0.23 (0.41)	(0.97)	(0.65)	-0.12 (0.45)				
	Padf	2.35	1.20	1.03 (0.33)	2.52	3.83	1 69(0 27)				
		(0.90)	(0.82)	1.05 (0.55)	(0.96)	(0.58)	1.09(0.27)				
	Alternative Hypothesis: Cointegration with Individual AR Coefficients										
	Grho	3.27	3 21(0.99)	2 87 (0.99)	3.64	3.12	2 92 (0 99)				
		(0.99)	5.21(0.99)	2.87 (0.99)	(0.99)	(0.99)	2.92 (0.99)				
	Can	1.23	0.52(0.70)	0.07 (0.53)	2.30	0.70	0.25 (0.60)				
	Орр	(0.89)	0.55(0.70)		(0.99)	(0.76)	0.23 (0.00)				
	Gadf	2.27	1 54(0.86)	1 43 (0 55)	2.90	2.28	2 20(0 48)				
	Gaui	(0.91)	1.54(0.80)	1.45 (0.55)	(0.99)	(0.68)	2.20(0.48)				
		Al	ternative Hypo	thesis: Cointegr	ation is Presen	t					
	Gt	-	4.07(0.20)	1.04(0.00)	5.96	5.03	2 33 (0.00)				
	θί	1.54(0.33)	4.07(0.20)	1.04(0.00)	(1.00)	(1.00)	2.33 (0.00)				
Westerlund	Ca	-	5 21(1.00)	5.06 (1.00)	5.49	4.97	5 16 (1 00)				
	Ua	6.22(0.00)	5.51(1.00)	5.00 (1.00)	(1.00)	(1.00)	5.10 (1.00)				
	D+	-	1.00(0.00)	0.24(0.00)	5.88	5.32	1.60 (0.00)				
	гı	3.13(0.67)	1.09(0.00)	-0.24(0.00)	(1.00)	(1.00)	1.09 (0.00)				
	Da	-	3 92(0.80)	3 64(1.00)	4.13	3.92	3 66 (0 60)				
	Ра	4.13(0.67)	3.92(0.80)	3.04(1.00)	(1.00)	(1.00)	5.00 (0.00)				

Cointegration Test

Note: Values reported in () are the probability values.

For the case of turnover ratio and broad money supply two indicators from the Westerlund provide evidence of cointegration. Afterwards, one indicator of Kao test provides evidence of cointegration for the case of market capitalization and domestic credit to private sector and for the case of stock traded and domestic credit to private sector. Lastly for the case of turnover ratio and domestic credit to private sector, one indicator from Kao test and two indicators from Westerlund cointegration test

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confirm presence of cointegration. Therefore, on the basis of the results reported in the Table -5, we may conclude that economic growth, stock market and banking sector development along with other controls have long run relationship in low human developed countries.

After discussing the estimates of cointegration test for the low human developed countries, now may present the results and discussion of the long run coefficients in the Table - 6. The results presented in the Table - 6 show six sub models for the case of low human development countries. In these six sub models three proxies of stock market development and two proxies of banking sector development are alternatively used as pairs with each other. Since this study has used the cross product of these proxies hence the individual coefficients will only provide the marginal impact of that proxy only. In order to see the overall effect of that proxy the new coefficient will be calculated from the cross product. The below given formula will provide the adjusted coefficients. This study will apply joint significance test in order to test the significance of adjusted coefficients and the coefficients of cross product terms.

Overall Effect of Stock Market Proxy = Coefficient of Stock Market Proxy + [(Coefficient of Corss Product) X (Mean Vlaue of Banking Sector Proxy)]

Similarly

Overall Effect of Banking Sector Proxy = Coefficient of Banking Sector Proxy + [(Coefficient of Corss Product) X (Mean Vlaue of Stock Market Proxy)]

In case of low human developed countries in the first three models the individual coefficients of the proxies of stock market development are insignificant and they are significant in the last three models but with negative sign. Almost similar situation is with the money supply. Money supply is either insignificant or has negative sign. In case of stock market development, the reason could be the low depth of stock market. In case of money supply, the possible reason could be deficit financing. Deficit financing in the long run may not be pro-growth. Besides, one should be cautious while interpreting these coefficients as the regression also includes interaction term and interaction term may render coefficients insignificant. The main effects are either insignificant or significant with negative sign. However, it is noticeable that domestic credit to private sector is performing better relative to money supply. This reinforces our conjecture that excess money supply might be going into deficit financing. Domestic credit to private sector is positive and significant in one case. As the credit to private sector is private investment so positive impact is understandable also for the reason that increase in money supply may not be necessarily equal to investment. The higher efficiency of private credit over money supply is also evident from the cross product. In cross product, credit to private term is positive and statistically significant with all three proxies of stock market development. One possible interpretation is that private sector in less developed countries is credit hungry and once the credit is advanced to the firms, GDP growth picks up. However, a counter to the above arguments could be that if the firms are credit hungry then why market capitalization is insignificant? Variety of possible interpretations can be put forward in this regard; (i) stock markets are generally shallow in low human developed countries or (ii) the number of enlisted firms in stock market may be low. Less developed countries are, a priori, bank based or banks are relatively more important. This has been aptly described by Shah (2009) which states that banking subsector dominates that financial sector whereas equity market plays relatively small role. Similarly, Anwar (2011) in his speech highlighted that banking system constitutes 88 percent of the total financial sector in Pakistan. The results are reported in the following Table -6:

	0			U		
		Model of Low Hu	man Developed Co	untries		
		(Dependen	t Variable lnGDP)			
Variables	Coef	Coef	Coef	Coef	Coef	Coef
variables	(prob)	(prob)	(prob)	(prob)	(prob)	(prob)
		Indicators of Sto	ck Market Develop	ment		
lnMC	0.057 (0.78)			-0.169 (0.06)		
lnST		0.03 (0.56)			-0.23 (0.07)	
InTURNRA			-0.11 (0.47)			-0.148 (0.02)
		Indicators of Ban	king Sector Develop	pment		
LnBMS	0.07 (0.65)	-0.08 (0.01)	0.128 (0.122)			
InDCTPS				-0.08 (0.5)	0.23 (0.02)	0.05 (0.55)
		Cont	rol Variables			
lnMIG	0.79 (0.26)	-0.18 (0.75)	1.32 (0.05)	1.49 (0.00)	1.00 (0.06)	1.66 (0.00)
InREMIT	0.029 (0.06)	0.034 (0.05)	0.033 (0.47)	-0.01 (0.62)	-0.09 (0.16)	-0.041 (0.25)
lnCPI	-0.06 (0.283)		-0.17 (0.02)	0.091 (0.25)		0.12 (0.24)
		Cro	ss Products			
lnMC * lnBMS	-0.01 (0.83)					
lnST * lnBMS		-0.008 (0.59)				
InTURNRA * InBMS			0.035 (0.47)			
InMC * InDCTPS				0.059 (0.04)		

TABLE 6

Long Run Coefficients and Speed of Adjustment

lnST * lnDCTPS					0.10 (0.04)					
InTURNRA * InDCTPS						0.06 (0.03)				
CONSTANT	-5.55 (0.58)	-5.59 (0.471)	-5.26 (0.23)	18.03 (0.00)	19.31 (0.00)	16.89 (0.00)				
	Adjusted Coefficients									
lnMC	0.023			-0.003						
lnST		0.003			0.052					
InTURNRA			0.0076			0.02				
lnBMS	0.046	-0.07	0.177							
InDCTPS				0.062	0.151	0.13				
	Joint Wald	Test for Testing S	ignificance of Adju	sted Coefficients						
Inst1 & (Inst1 * inst 2) ⁷	0.66 (0.72)	1.03 (0.60)	0.52 (0.77)	4.50 (0.10)	5.04 (0.08)	5.32 (0.06)				
Inst2 & (Inst1 * inst 2) ⁸	0.75 (0.69)	7.84 (0.02)	3.30 (0.19)	36.32 (0.00)	5.43 (0.07)	8.79 (0.01)				
Convergence & significance ⁹ [ecm t - 1]	-0.34 (0.02)	-0.38 (0.02)	-0.73 (0.00)	-0.14 (0.00)	-0.55 (0.00)	-0.20 (0.00)				
Models	CMG	CMG	CMG	MG	CMG	MG				

Note: Values reported in () are the probability values.

The individual coefficients do not conform to the theory. Beyond doubt, growth is a complex process and it can be safely assumed that institutions are not pro-growth in low human developed countries. the Besides. there is need to look in substitutability and complementarities of the relationship. There is a complementarity between private sector credit and stock market proxies. Interestingly, all the individual coefficients of stock market which were negative and significant turned up positive and significant in the interaction term with credit to private sector. This means that banking and stock exchange are complementary in low human developed countries. For the net effect, adjusted coefficients are the representative ones. The net effects in case of equity market proxies, given the level of money supply remain insignificant. This is not surprising, as we have already raised the point that if money supply is going into the deficit financing, the positive significant effect is highly improbable. For instance, as highlighted by Fundanga (2011), in Zambia, which is also in the sample, though budget

⁷ This is joint coefficient restriction test on the stock market indicator and the cross product

⁸ This is joint coefficient restriction test on the banking sector indicator and the cross product

⁹ This is the value of ECM in short run and its probability value. For the convergence to exist it must be negative and significant

deficit declined to 2.2 percent of GDP in 2010 but it was 8 percent of GDP in 2001. Contrary to the money supply, the net effects in case of equity market proxies, given the level of private sector credit is positive and significant. Similarly, the net effect of credit to private sector conditioned upon the level of equity market proxies is positive and significant. This all warrants that credit to private sector is a crucial variable for the GDP growth. This is, of course, quite intuitive also.

Comparing with the existing literature, the following situation emerges. Qayyum *et al.* (2012) found that liquid liabilities and private sector credit did not affect economic growth significantly but the interaction terms of both liquid liabilities and domestic credit to private sector with inflation were leaving significant and negative effect on economic growth in 9 selected low income countries. The findings further reveal that market capitalization and value of traded stocks were significantly enhancing economic growth but interaction terms of these measures with inflation were significantly hindering economic growth into these selected countries. The results are in contrast with ours. Enisan and Olufisayo (2009) also found that long run relationship does not exist in case of Cote d, Ivoire, Nigeria, Keyna, and Zimbabwe. However, the results of Chaudhry *et al.* (2012) confirmed long run co-integration between financial development and economic growth in Pakistan. This is in line with this study.

To an extent the relationship between GDP growth and market capitalization, stock traded and turnover ratio can also be explained through the graphic relationship between the two, respectively. The sharp divergence between turnover ratio and GDP is also evident from the negative sign of the coefficient (See Figure 1).

Regarding, control variables, migration impacts economic growth positively and significantly. Keeping this in mind, it can be safely assumed that Lewis (1954) model of development is at work in the low human development countries. On the whole, it can be concluded that domestic credit to private sector emerges as a significant determinant of GDP growth.

FIGURE 1

Relationship between Stotck Market, Banking Sector and Economic Growth in Low Human Development Countries



As far as the short run coefficients for these six sub models are concerned, we are only reporting the coefficients of ecm_{t-1} in Table 6. The negative and significant coefficient of ecm_{t-1} will ensure convergence hypothesis which reveals that if any macroeconomic shock hits in low human developed countries then the six proposed models have power to restore to stable and long run equilibrium. From the results we could see that the coefficient of ecm_{t-1} has found to be negative and significant therefore, it confirms the prevalence of convergence hypothesis in low human developed countries.

DIAGNOSTIC TEST

The Table 7 provides summary of all the diagnostic tests for all the estimated models for low human developed countries. The diagnostic tests include F test of the overall model to see its fitness and its p value to

decide which hypothesis is accepted¹⁰, RMSE value to compare efficiency with other models, Hetroskedasticity test to see presence of hetroskedasticity in the model. Residual stationary test to see if the model is cointegrated or spurious, cross sectional dependence test which checks the cross sectional correlation among the model, convergence and significance test provides the coefficient of convergence variable in the short run model and its probability value (P - Value) showing its significance. The results reported in Table 7 show that the value of F – test is significant for all the six specifications at 1% level of significance, which shows that all of the models are fit and the proposed independent variables are significantly explaining the variation in the dependent variable. While comparing the value of Root Mean Square Error, it could be seen that all of the values are almost similar showing that the efficiency level is almost similar for all six models. Hetroskedasticity test uses the R square and the sample size of the residual equation as illustrated in the methodology chapter, the product of these two follows chi – square distribution, if this chi – square value is smaller than the critical value we can safely say that there is not hetroskedasticity since null hypothesis will be accepted¹¹.

Since there are 5 independent variables in the hetroskedasticity test equation so the degree of freedom is 5 and at 5% level the critical value from the chi square distribution table is 10.07 and while comparing all of the six values it can be seen that there is no evidence of hetroskedasticity in all the six models of low human developed countries. The fourth diagnostic is the stationarity test of the residuals, the purpose of this test is to confirm whether residuals are stationary or not or whether all the I (1) variables are forming cointegrated relation or are the estimated results are spurious. The CIPS panel unit root test is used to test stationarity of residuals, the null hypothesis of the test is that the variable is non stationary and the alternative hypothesis is that the variable is stationary in nature at this level. The table shows the CIPS test value and p value. It can be seen that all of the P values are less than 0.05 ensuring acceptance of alternative hypothesis at 5% level. Hence it can be said that all the six estimated residuals are stationary leading to equations being cointegrated.

¹⁰ Ho: Model not fit, H1: Model is fit

¹¹ Ho: no hetroskedasticity, H1: model has hetroskedasticity

The fifth diagnostic is the cross sectional autocorrelation test also called cross sectional dependence, the null hypothesis is that the cross sectionals are independent and the alternative hypothesis is that the cross sectionals are dependent. From the results we may see that for all the six estimated equations, none of the probability value is less than 0.05 confirming acceptance of null hypothesis in all the cases hence there is not cross sectional autocorrelation issue in low human developed countries. The results are given in Table 7:

Group	Low Human Developed Countries					
Model Fitness and Comparison						
F test (Probability – Value)	12.78 (0.04), 24.45 (0.00), 57.09 (0.00), 112.7 (0.00), 104.4 (0.00), 201.6 (0.00)					
RMSE 12	0.018, 0.015, 0.019, 0.067, 0.060, 0.050					
	Diagnostics					
Hetroskedasticity Test (chi2 value) ¹³	250*0.02 = 5.00, 250*0.02 = 5.00, 249*0.016 = 4.98, 250*0.029 = 7.25, 250*0.025 = 6.25, 249*0.017 = 4.2					
Residual Stationarity / Autocorrelation test (CIPS P value) ¹⁴	-11.14 (0.00), -11.63 (0.00), -10.11 (0.00), -3.69 (0.00), -4.58 (0.00), -4.74 (0.00)					
Cross Dependence Test Test (p value) ¹⁵	-0.02 (0.98), -0.56 (0.57), -1.58 (0.11), 1.65 (0.10), 1.44 (0.15), 0.42 (0.67)					

TABLE 7

Overall Diagnostics for all the Groups

Note: Values reported in () are the probability values.

¹² RMSE is used to compare across models since all of them are almost similar hence they have similar efficiency level

¹³ The critical value from the chi square table at 5% is 14.067, the first row is back ground calculation and the second row is the calculated chi square value which is compared against the critical value. The null hypothesis here is that there is no hetroskedasticity.

¹⁴ This is panel unit root CIPS test p value, here null hypothesis is that the residuals are non-stationary

¹⁵ These are p values of cross sectional dependence test where null hypothesis is that residuals are cross sectionally independent.

V. CONCLUSION AND POLICY IMPLICATIONS

In this study, the impact of stock market and banking sector development is tested on economic growth using sample period from 1989 to 2013 for low human developed countries. This study uses mean group and common mean group to find out long run coefficients whereas error correction specification for finding short run coefficients. The empirical findings represent that in a model of market capitalization and domestic credit to private sector: adjusted coefficient of domestic credit to private sector leaves positive and significant effect on economic growth in long run in low human developed countries. The coefficient of interaction term of market capitalization and domestic credit to private sector is also found to be positive and significant which concludes that both market capitalization and domestic credit to private sector are important to elevate economic growth in low human developed countries.

Moreover, the adjusted coefficients of traded stock and credit to private sector along with their interaction term are significantly elevating economic growth in case when traded stock is regressed with credit to private sector in long run in low human developed countries. The same is found for the case when turnover ratio is regressed with credit to private sector. This shows that traded stocks and turnover ratio (proxies of stock market development) are significantly appreciating economic growth when they are regressed with domestic credit to private sector which is taken as proxy for banking sector development. The interaction terms of all the three proxies of stock market development with domestic credit to private sector are showing that both sectors should be taken together to enhance economic growth in low human developed countries. The positive and significant effect of domestic credit to private sector on economic growth is supported by Adusei (2013) and Malki and Assaf (2014) whereas the positive and significant effect of stock traded and turnover ratio on economic growth is supported by Hailemariam and Guotai (2014). Additionally, the coefficients of internal migration and remittances represent positive and significant effect on economic growth in four and two models out of six models in long run in low human developed countries respectively. In one out of four models, this study finds negative and significant effect of inflation on economic growth in long run in low human developed countries. The positive and significant effect of internal migration on economic growth is supported by Lewis

(1954) whereas the positive and significant effect of remittances on economic growth is supported by Fayissa and Nsiah (2010). The finding related to negative effect of inflation on economic growth is consistent with Bittencourt *et al.* (2015).

As credit to private sector is very important in low human developed countries so, the governments must focus banking sector but it does not rule out the efforts to improve the capital market. As the banking sector is more important so does the well-defined property rights because it provides the source of collateral and this point has already been emphasized by Stiglitz (1989). Moreover, the findings also represent that among the proxies of stock market, market capitalization emerges as one of the robust proxy that enhances economic growth in low human developed countries relative to stock traded and turnover ratio in case when market capitalization interacts with domestic credit to private sector. This study suggests that while formulating policies related to stock market development, policies which broad the scope of market capitalization may be given more importance to increase economic growth in low human developed countries..

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CORRELATES OF HUMAN DEVELOPMENT INDEX IN LOW, MEDIUM, HIGH AND VERY HIGH HUMAN DEVELOPED NATIONS

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Abstract. Now days, Human Development Index (HDI) has turned into an orthodox symbol for regional and national growth of a country as well as the widely used multidimensional welfare measure. A yearly ranking of 188 associated countries on HDI in human development report published by United Nations is a zealously awaited episode that gets significant media attention and public response. Unfortunately, many developing countries still consider GDP or wealth as an indicator for its economic and social growth and focused only on its development while developed countries focused on the development and well-being of their public in terms of their better education and quality of life. In present research, correlates of HDI were explored in very high, high, medium and low human development countries and the findings of the research will be beneficial for the policy makers to keep concentrate on the associated factors with HDI in order to increase the human development index of their country e.g., life expectancy at birth, women empowerment, average years of schooling for male, public health expenditures, public expenditures on education, total tax revenues, research & development expenditures, taxes on income, profit & capital gain, domestic credit provided by financial sector, labour force participation rate, employment to population ratio, private capital flows, net

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migration rate, international student mobility and unemployment benefits recipients are positively associated with human development index in very high human development index countries. In addition, factors that are inversely related with HDI in very high human development index nations are average annual GDI growth, female & male adult mortality rate, external debt stock, total debt service, infant's mortality due to outdoor pollution, employment in agriculture, youth unemployment, male & female domestic workers and child labour.

Keywords: Human development index, GDP, Life expectancy, Quality of Life, Human inequality

JEL classification: O15, E01, D63

I. INTRODUCTION

Now a day, human development index (HDI) is used as a sign for fiscal and societal progress of a country as earlier GDP serves the purpose [Mariano et al., 2015]. In spite of the fact that financial development, expanding exchange and speculation, innovative progress - are critical, yet advancement prepares tend to concentrate on more individuals instead of simple monetary development of any country or state altogether [Atkinson et al., 2016]. Along these lines, center has moved to human development (HD), which is about individuals, about growing their decisions to live full and innovative lives with flexibility and poise. The idea of human development has wide acknowledgment among academicians, analysts, organizers, decision makers and is similarly acknowledged among developing and developed nations (Madan, 2012).

In addition, high GDP of a country does not ensure the good quality of life and social development in the country as GDP is certainly just a single component of one's life that upgrades financial prosperity [Chatterjee, 2005]. Consequently, for cross country comparisons per capita income will be misleading as a meter of well-being across the diverse societies [Foster et al., 2005]. This has been explicitly perceived and is surely the method of reasoning behind the advancement of more powerful measures of prosperity, for example, e.g. the Human Development Index (HDI) of the United Nations [UNDP, 1990]. HDI is ascertained on the premise of three elements life span, access to information and way of life [UNDP, 1990] The HDI serves as a reference tool for both social and monetarist advancement. It is an instrument used for checking long haul advance in a nation's normal level of human improvement in three fundamental measurements: an elongated and sound lifespan, access to information and a respectable way of life. The HDI was acquainted in 1990 with stress that individuals and their abilities ought to be definitive criteria for surveying the improvement of a nation, not simply monetary development. The incorporation of education and wellbeing markers is an indication of fruitful government approaches in giving access to vital legitimacy merchandise, for example, human services, sanitation and education [UNDP, 2015].

It might be brought up that HDI is not the primary endeavor to swap the per capita GNP [Hou et al., 2015; Ustubici, 2012]. Actually, a prior endeavor to total three human markers (literacy, infant mortality and life expectancy at year one) into a solitary list is the Physical Quality of Life (Chawdhary, 1991; Morris, 1979; Stewart, 2006). This method includes the quantity of life but not the quality of life. Moreover infant mortality and life expectancy are highly correlated variables [Murray, 1988]. In contrary to this, HDI covers all these issues and embrace the quantitative as well as qualitative aspects of life [Rodionova & Gordeeva, 2010]. To achieve the economic growth any country must need to set a threshold of human development as a prerequisite because it determines the consistent growth for society.

The United Nations classifies countries as having a low, medium, high or very high human development index (UNDP 2014). These countries have different infrastructure, political system, social development and many other factors that might affect directly or indirectly human development in the country. In present study, we explore the possible associated factors of HDI among high developed nations to low developed nation. The outcomes of the study will be helpful for the low developed nations to identify the shortcomings in their policies that obstacle them to be in among the high developed nations. By concentrating on the factors associated with higher HDI low developed nations can improve human development index.

II. MATERIALS AND METHODS

The data used in the present research was a secondary data obtained from United Nations Development Report published in 2015 (UNDP 2015). The primary variable of interest was HDI that quantifies human development by taking literacy rate and school enlistment as a measure of knowledge, life expectancy as a tool of long and healthy life, furthermore, per capita GDP in view of buying force equality as a measure of material richness level. So HDI was comprised of three components; longevity, education level and decent standard of living. These three components were computed as:

$$Longevity = Life Expectancy Index(LEI) = \frac{Life Expectancy - Life Expectancy_{min}}{Life Expectancy_{max} - Life Expectancy_{min}}$$
(2.1)

$$Education Index(EI) = \frac{2}{3} * \left(\frac{Adult Literacy - Adult Literacy_{min}}{Adult Literacy_{max} - Adult Literacy_{min}} \right) + \frac{2}{3} * \left(\frac{Enrollment - Enrollment_{min}}{Enrollment_{max} - Enrollment_{min}} \right)$$
(2.2)

$$GDP Index (GDPI) = \frac{\ln (GDP) - \ln (minimum GDP)}{\ln (2.3)}$$

ln (maximum GDP)-ln (minimum GDP)

HDI is simply the average of (2.1), (2.2) and (2.3) i.e.,

$$HDI = \frac{LEI + EI + GDPI}{3}$$
(2.4)

In present data HDI was calculated from 188 countries (very high 49, high 56, medium 39 & low 44) and the classifications of HDI were based on the quartiles of the HDI distribution. For low human development countries HDI was below 0.550; medium human development 0.550-0.699; high human development 0.700-0.799 and for very high human development countries value of HDI was atleast 0.800. Pearson and Spearman's correlation coefficient were used to measure the relationship between HDI and other factors in low human development countries – very high human development countries. All the data were analyzed in SPSS v 24.

III. RESULTS AND DISCUSSION

HUMAN DEVELOPMENT INDEX AND ITS CONSTITUENTS

Life expectancy at nascence is the numeral years of a neonatal who might live when usual forms of age-specific mortality rates at the time of nascence prevail in a similar fashion and has high significant positive relationship with HDI in very high human development index countries (r = 0.720, p<0.01); significant positive relationship (r = 0.327, p<0.05) in low HDI countries while no significant relationship in high HDI and low HDI countries exist. Estimated years of schooling is the amount of years of education that a kid of school entering age can presume to have when usual forms of age-specific admission rates and has highly significant positive relationship with HDI (p<0.01) in all four classifications of HDI countries. Mean years of schooling is the average amount of years of schooling taken by individuals of ages 25 and older, transformed from education accomplishment stages spending certified intervals of each level and found highly significantly positively related with HDI in very high human development countries (r = 0.661, p<0.01) followed by medium human development countries (r = 0.639, p<0.01), low HDI countries (r = 0.607, p<0.01) and high human development countries (r =0.442, p<0.01). Gross national income (GNI) per capita is the collective sources of an economy spawned by its making and its possession of elements of production, minus the expenditures on aspects of production possessed by the rest of the world also has significant positive relationships (p<0.01) with HDI in all the four types of human development countries. HDI is inversely significantly related with average annual GDI growth (2010-2014) in only very high human development countries.

TABLE 1

	HDI Nations						
	Very High	High	Medium	Low			
Life expectancy at birth (years)	0.720**	0.145	0.198	0.327*			
Expected years of schooling	0.543**	0.342**	0.448**	0.574**			
Mean years of schooling	0.661**	0.442**	0.639**	0.607**			

Correlations of HDI and its constituents
	HDI Nations				
	Very High	High	Medium	Low	
Gross national income (GNI) per capita	0.516**	0.682**	0.587**	0.670**	
Average annual GDI growth (%, 2010-2014)	-0.293*	0.103	-0.131	-0.032	

HUMAN DEVELOPMENT INDEX AND FACTORS RELATED TO INEQUALITY-ADJUSTED HUMAN DEVELOPMENT

Coefficient of human imbalance is a normal disparity in three fundamental measurements of human advancement and found inversely significantly (p<0.05) related with HDI in high and medium human development countries. Inequality in life probability is the imbalance in conveyance of expected length of life in view of information from life tables assessed utilizing the Atkinson disparity record and is also significantly related with HDI in all four types of HD countries. Inequality in education is an imbalance in appropriation of years of education in view of information from family unit studies evaluated utilizing the Atkinson disparity index and has significant (p<0.05) adverse effects on HDI in medium HD countries. Inequality in income is an imbalance in wage conveyance in view of information from family unit studies evaluated utilizing the Atkinson imbalance record and has no significant relations with HDI across all the types of HD countries.

TABLE 2

Correlations of HDI and Factors related to Inequality-adjusted Human Development

	HDI Nations				
	Very High	High	Medium	Low	
Coefficient of Human Inequality	-0.109	-0.271*	-0.350*	-0.294	
Inequality in Life Expectancy (%)	-0.565**	-0.421*	-0.404*	-0.531**	
Inequality in education (%)	-0.053	-0.185	-0.317*	-0.196	
Inequality in income (%)	-0.022	-0.204	-0.146	0.093	
Income Inequality (Gini coefficient)	0.073	0.003	0.150	0.035	

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HUMAN DEVELOPMENT INDEX AND GENDER DEVELOPMENT

Gender Development Index is a ratio of female to male HDI observations and has no significant relationships with HDI in all four types of HD countries. Life expectancy at birth (years) for female is highly significantly (r = 0.533, p<0.01) related with HDI in very high human development countries followed by low HD countries (r = 0.326, p < 0.05) and high HD countries (r = 0.316, p < 0.05) while life expectancy at birth (years) for male is positively significantly related with HDI in very high (r = 0.657, p< 0.01) and low (r = 0.323, p< 0.05) HD countries. Expected years of schooling for female is highly significantly related with very high and low HD countries while it is significantly related with HDI in high HD countries and has no significant relation in medium HD countries. Mean years of schooling both for male and female are positively significantly associated with HDI in all four types of HD countries. Although estimated gross national income per capita for both female and male are significantly associated with HDI in all HDI category countries but comparatively female gross per capita income is strongly correlated with HDI than male in very high and high HD countries while this factor among male has stronger association than female in low and medium development nations. Gender inequality index is also inversely related with HDI in very high and low HD countries. Shares of women seats in parliament is strongly positively associated (r =0.441, p<0.01) with HDI in very high human development nations.

TABLE 3

Correlations of Human Development Index and Gender Development

	HDI Nations			
	Very High	High	Medium	Low
Gender Development Index	-0.071	0.079	0.230	0.169
Life expectancy at birth (Years) for Female	0.553**	0.316*	0.283	0.326*
Life expectancy at birth (Years) for Male	0.657**	0.096	0.183	0.323*
Expected Years of Schooling for Female	0.437**	0.328*	0.312	0.410**
Expected Years of Schooling for Male	0.585**	0.344**	0.198	0.293
Mean Years of Schooling for Female	0.556**	0.266*	0.440**	0.495**

	HDI Nations			
	Very High	High	Medium	Low
Mean Years of Schooling for Male	0.592**	0.306*	0.416**	0.458**
Estimated gross national income per capita (Female)	0.632**	0.454**	0.359*	0.639**
Estimated gross national income per capita (Male)	0.452**	0.449**	0.574**	0.642**
Gender Inequality Index	-0.561**	-0.228	-0.053	-0.393**
Representation of women in parliament (%)	0.441**	0.112	0.111	0.066

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND POPULATION TRENDS

Population size has no significant relationships with HDI in all four categories of HD countries. Average annual population growth rate is inversely significantly related with HDI in low (r = -0.394, p<0.01) and medium (r = -0.383, p< 0.05) HD countries and has no significant relationships in very high or high human development countries. Urban population (%) is only positively associated (r= 0.395, p<0.05) with HDI in medium HD countries. Median age (years) is positively related with HDI in high (r = 0.445, p< 0.01), medium (r = 0.423, p< 0.01) and low (r = 0.465, p< 0.01) HD countries. Early age dependence ratio is a proportion of the populace ages 0-14 to the populace ages 15-64, communicated as the quantity of dependents per 100 individuals of working age (ages 15-64) and has inverse effects on HDI in high (r = -0.459, p< 0.01), medium (r = -0.418, p< 0.01) and low (r = -0.501, p< 0.01) HD countries while for the dependency ratio (old age: 65 and above) is significantly positively related with HDI in all four types of HD countries. Total fertility rate is the quantity of minors that would be destined to a lady if she somehow managed to alive till the end of her fertility years and bear kids at every age as per age-specific prolificacy rates and has negative significant impact over HDI in low, medium and high HD countries.

	HDI Nations				
	Very High	High	Medium	Low	
Population (Millions)	0.247	0.149	0.128	0.261	
Average Annual Population Growth Rate (%)	0.213	-0.135	-0.383*	-0.394**	
Urban Population (%)	0.154	0.207	0.395*	0.087	
Median Age (Years)	0.183	0.445**	0.423**	0.465**	
Dependency ratio (per 100 person ages 15-64)/(per 100 person ages 15-64)	0.067	-0.459**	-0.418**	-0.501**	
Dependency ratio (per 100 person ages $15-64$)/(old age ≥ 65)	0.316*	0.341*	0.378*	0.313*	
Total fertility rate (births per woman, 2010/2015)	-0.009	-0.304*	-0.410*	-0.582*	

TABLE 4

Correlations of HDI and Population Trends

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND HEALTH OUTCOMES

Infants lacking immunization against DPT is the rate of surviving babies who did not received their principal dosage of pertussis, diphtheria, and tetanus vaccine and has no association with HDI in any category of HDI country while infants lacking immunization measles is significantly inversely related (r = -0.401, p<0.05) with HDI in medium HDI countries. Infants mortality rate also has significant adverse effects on HDI in very high (r = -05.40, p<0.01), high (r = -0.361, p<0.01), medium (r = -0.419, p<0.01) and low (r = -0.356, p<0.05) human development indexed countries. Similar fashion is observed between HDI and under five years mortality rates. Child malnutrition is not significantly related with HDI in very high, high and low HD countries while significantly associated in medium HD countries. Gender wise mortality rate is significantly inversely related with HDI in only very high HD countries. Life expectancy at age 60 has positive significant (p<0.01) impact over HDI in very high and low HD countries. No of physicians is also positively significantly related with HDI in high, medium and low HD countries. In addition, public health expenditures are significantly (r = 0.412, p<0.01) positively related with HDI in only very high human development indexed countries.

TABLE 5

Correlations of HDI and Heath Outcomes

	HDI Nations			
	Very High	High	Medium	Low
Infants lacking immunization DTP (% of 1-year olds)	0.005	0.019	-0.236	-0.276
Infants lacking immunization Measles (% of 1-year olds)	0.171	0.081	-0.401*	-0.292
Infants mortality rates (per 1,000 live births)	-0.504**	-0.361**	-0.419**	-0.356*
Under-five years mortality rates (per 1,000 live births)	-0.523**	-0.365**	-0.435**	-0.398**
Child malnutrition (% under age 5)	-0.268	-0.178	-0.364*	-0.240
Female Adult mortality rate (per 1,000 people)	-0.394**	-0.126	-0.243	-0.260
Male Adult mortality rate (per 1,000 people)	-0.450**	0.208	0.094	-0.197
Life expectancy at age 60 (Years)	0.655**	-0.040	-0.043	0.402**
Physicians (per 10,000 people)	0.162	0.459**	0.450**	0.548**
Public health expenditure (% of GDP)	0.412**	0.056	0.080	-0.133

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND EDUCATION ACHIEVEMENTS

Population with atleast some secondary education is significantly positively associated with HDI in very high (r = 0.344, p<0.05), medium (r = 0.462, p<0.01) and low (r = 0.303, p<0.05) human developed countries. Pre-primary gross enrollment ratio has significant impact on HDI in low (r = 0.619, p<0.01) HD countries followed by very high (r = 0.334, p<0.05) HD countries while primary gross enrollment ratio has positive relation in low HD countries and negative relation in medium HD countries. Secondary gross enrollment ratio also has positive relations with HDI in very high (r = 0.326, p<0.05), medium (r = 0.489, p<0.01) and low (r = 0.494, p<0.01) human developed countries. In addition, tertiary gross enrolment ratio is also positively related with HDI in all four types of HD countries. Primary school dropout ratio is inversely related with HDI in very high (r = -0.451, p<0.01), hig

0.288, p<0.05) and medium (r = -0.610, p<0.01) human development countries. Number of teacher-student ratio in primary school is negatively significantly related with HDI in low and medium HD countries group. Public expenditures on education (% of GDP) also have significant (r = 0.414, p<0.01) relation with HDI in only very high HD countries.

TABLE 6

	HDI Nations			
	Very High	High	Medium	Low
Population with atleast some secondary education (% ages ≥ 25)	0.344*	0.196	0.462**	0.303*
Pre-primary gross enrollment ratio (% pre-school age children)	0.334*	0.208	0.179	0.619**
Primary gross enrollment ratio (% primary school age population)	0.031	-0.159	-0.371*	0.318*
Secondary gross enrollment ratio (% secondary school age population)	0.326*	0.250	0.489**	0.494**
Tertiary gross enrollment ratio (% tertiary age population)	0.283*	0.375**	0.472**	0.368*
Primary school dropout ratio (% of primary school cohort)	-0.451**	-0.288*	-0.610**	-0.153
Primary school pupil-teacher ratio (no. of pupils per teacher)	-0.042	-0.249	-0.525**	-0.346*
Public expenditure on education (% of GDP)	0.414**	-0.093	0.055	0.144

Correlations of HDI and Education Achievements

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND NATIONAL INCOME & COMPOSITION OF RESOURCES

Gross domestic product (GDP) is the aggregate of gross esteem included by every single inhabitant maker in the economy in addition to any item assessments and short any appropriations excluded in the estimation of the items, communicated in 2011 global dollars utilizing buying power equality rates and has positive significant relation with HDI in very high (r = 0.396, p<0.01) and low (r = 0.311, p<0.05) HD countries. GDP per capita is a GDP in a specific tenure isolated by the aggregate populace for a similar period and has significant positive relation with HDI in all the four type of HD countries. Gross fixed capital formation is an estimation of procurements of novel or standing settled resources by the corporate area, administrations and family units (barring their independent ventures) minus transfers of settled resources, communicated as a rate of GDP and has no significant relation with HDI across all the categories of HDI countries. General government closing consumed spending is the entirely administration current consumptions for buys of merchandise and enterprises (counting pay of workers and most uses on national safeguard and security yet barring government military uses that are a piece of government capital arrangement), communicated as a rate of GDP and has no association with HDI. Total tax revenue is the aggregate necessary exchanges to the focal government for open dedications, communicated as a rate of GDP and is significantly positively associated (r = 0.303, p<0.05) with HDI in only very high human development countries. Taxes on income, profit and capital gain are the duties demanded on the genuine or hypothetical net wage of people, on the benefits of companies and undertakings and on capital increases, whether acknowledged or not, ashore, securities and different resources; and are significantly positively associated (r = 0.625, p<0.01) with HDI in only very high human development countries. Research and development expenditures are the present and capital uses (both private and public) on inventive work embraced efficiently to expand information and the utilization of learning for new solicitations, communicated as a rate of GDP. This factor also has significant positive impact on HDI in very high (r = 0.632, p<0.01), high (r = 0.360, p<0.01) and medium (r = 0.379, p<0.05) HD countries. Domestic credit provided by financial sector is a worthy representative for different areas on a gross premise (aside from credit to the focal government, which is net), communicated as a rate of GDP and is significantly positively associated (r = 0.563, p < 0.01) with HDI in very high human development countries only. External debt stock is an obligation owed to out-of-state people repayable in remote cash, products or administrations, communicated as a rate of gross national income (GNI) and is inversely related (r = -0.350, p<0.05) with HDI in very high human development nations. Total debt service: Totality of foremost reimbursements and intrigue really paid in outside coin, products or administrations on long haul obligation; intrigue

paid on fleeting obligation; and reimbursements to the International Monetary Fund, communicated as a rate of GNI and is also inversely related (r = -0.350, p<0.05) with HDI in very high human development countries. Consumer price index has no association with HDI in all four types of HD countries.

TABLE '	7
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Correlations of HDI and national income & composition of resources

	HDI Nations			
	Very High	High	Medium	Low
Gross domestic product (GDP) "Total PPP \$ billions)"	0.396**	0.242	0.295	0.311*
Gross domestic product per capita (2011 PPP \$)	0.466**	0.719**	0.573**	0.577**
Gross fixed capital formation (% of GDP)	0.219	-0.048	-0.130	-0.168
General government final consumption expenditure "Total (% of GDP)	0.175	-0.060	0.212	0.017
General government final consumption expenditure "Total (% of GDP)	-0.215	0.172	-0.031	-0.164
Total tax revenue (% of GDP)	0.303*	-0.072	-0.075	-0.014
Taxes on income, profit and capital gain (% of total tax revenue)	0.625**	-0.256	-0.126	0.170
Research and development expenditure (% of GDP)	0.632**	0.360**	0.379*	0.123
Domestic credit provided by financial sector (% of GDP)	0.563**	-0.040	0.101	0.115
External debt stock (% of GNI)	-0.350*	-0.155	-0.055	-0.239
Total debt service (% of GNI)	-0.350*	-0.070	0.249	0.113
Consumer price index (2010=100)	-0.193	0.079	-0.254	0.203

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND ENVIRONMENTAL SUSTAINABILITY

Fossil fuels is the rate of aggregate vitality supply that originates from common assets shaped from biomass in the topographical preceding (like natural gas, oil and coal) and is positively significantly related with HDI in medium (r = 0.357, p<0.05) and low (r = 0.402, p<0.01) human developed countries while renewable energy sources are the rate of aggregate vitality supply that originates from always recharged regular procedures, including sun powered, biomass, geothermal, wind, hydropower and sea assets, and certain waste barring atomic vitality and has positive relation with HDI in only low HD countries. Electrification rate is the general population with access to power, communicated as a rate of the aggregate populace and incorporates power sold financially (both on off grid and grid) and self-created power yet rejects unapproved associations. It is positively associated with HDI in very high (r = 0.456, p<0.01), medium (r = 0.640, p<0.01) and low (r = 0.468, p<0.01) HD countries. Rural electrification rate also possesses the similar fashion of association with HDI. Carbon dioxide emissions per capita (tonnes) is positively significantly associated with HDI in high, medium and low HD countries while average annual growth (%) in carbon dioxide emissions per capita (tonnes), natural resources diminution, natural resources forest area and fresh water withdrawals have no association with HDI in all four types of HD countries. Infants mortality due to open-air pollution is inversely related with HDI in very high HD countries while infants mortality due to internal air pollution is inversely related with HDI in high and medium HD countries. In addition, infants mortality due to poor sanitization is also inversely related with HDI in high (r = -0.374, p<0.01), medium (r = -0.395, p<0.05) and low (r = -0.507, p<0.01) HD countries. Population living on degraded land is the rate of the populace living on extremely or seriously debased land its deprivation considers soil well-being, biomass, biodiversity and water amount. This factor has no association with HDI in any type of HD countries. is the general population requiring quick help amid a time of crisis as a consequence of a characteristic calamity, including uprooted, cleared, destitute and harmed individuals, communicated per million individuals and has inverse relation (r = -0.349, p<0.01) with HDI in high human developed countries.

TABLE 8

Correlations of HDI and Environmental Sustainability

	HDI Nations			
	Very High	High	Medium	Low
Primary energy supply through Fossil fuels (% of total)	-0.107	0.212	0.357*	0.402**
Primary energy supply through Renewable sources (% of total)	0.208	0.091	0.034	0.319*
Electrification rate (% of population)	0.456**	0.087	0.640**	0.468**
Rural Electrification rate (% of population)	0.399**	0.100	0.563**	0.472**
Carbon dioxide emissions per capita (tonnes)	0.142	0.549**	0.608**	0.608**
Average annual growth (%) Carbon dioxide emissions per capita (tonnes) 1970/2011	-0.141	-0.183	-0.046	0.237
Natural resource depletion (% of GNI)	-0.220	-0.055	0.053	-0.303
Natural resources forest area (% of total land area)	-0.030	-0.093	-0.294	-0.013
Natural resources Forest area (% change) 1990/2012	-0.025	0.096	0.273	-0.118
Fresh water withdrawals (% of total renewable water resources, 2005-2014)	-0.046	-0.111	0.127	-0.008
Deaths of children (< 5 years of age) due to outdoor pollution (per 100,000 children under age 5)	-0.318*	-0.193	-0.151	-0.246
Deaths of children (< 5 years of age) due to indoor pollution (per 100,000 children under age 5)	-	-0.540**	-0.309	-0.511**
Deaths of children (< 5 years of age) due to poor sanitization (per 100,000 children under age 5)	-0.166	-0.374**	-0.395*	-0.507**
Population living on degraded land (%)	-0.103	0.067	0.160	-0.090
Population affected due to natural disasters (average per million people)	0.053	-0.349**	-0.093	-0.053

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND WORK & EMPLOYMENT

Employment to population ratio is a percentage of the working population with atleast 15 years of age and is positively significantly (r =

0.351, p<0.05) associated with HDI in very high human development countries. Labour force participation rate is a rate of a nation's workingage populace that draws in effectively in the work advertise, either by working or searching for work. It gives a sign of the comparative magnitude of the supply of work accessible to take part in the production of goods and enterprises. It is also positively significantly (r = 0.288, p<0.05) associated with HDI in very high human development countries. Employment in agriculture (% of total employment) has significant negative relation with HDI in very high HD nations only while employment in service (% of total employment) is positively significantly associated with HDI in very high (r = 0.488, p<0.01), high (r = 0.274, p<0.05) and medium (r = 0.474, p<0.01) human develop indexed countries. Labour force with tertiary education also has positive association with HDI in very high and medium HD countries while vulnerable employment is inversely related with HDI in high and medium HD countries. Total unemployment has no association with HDI while long term unemployment and youth unemployment have adverse effects on HDI. Output per worker is positively significantly related with HDI in very high, high and medium HD countries. Hours worked per week (per employed person) are also positively associated with HDI in only low human development countries.

TABLE	9
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	HDI Nations			
	Very High	High	Medium	Low
Employment to population ratio (% ages \geq 15)	0.351*	0.188	0.036	-0.112
Labour force participation rate (% ages ≥ 15)	0.288*	-0.033	-0.286	-0.119
Employment in agriculture (% of total employment)	-0.309*	-0.149	-0.264	0.015
Employment in Service (% of total employment)	0.488**	0.274*	0.474**	0.134
Labour force with tertiary education (%)	0.560**	0.247	0.397*	0.275
Vulnerable employment (% of total employment)	-0.060	-0.318*	-0.415**	-0.241
Total Unemployment (% of labour force)	-0.257	-0.193	0.213	0.177
Long-Term Unemployment (% of labour force)	-0.321*	0.060	0.360*	0.145

Correlation between HDI and Work & Employment

	HDI Nations			
	Very High	High	Medium	Low
Youth Unemployment (% of youth labour force)	-0.391**	-0.251	0.272	0.014
Youth not in employment or school (% ages 15-24)	-0.115	0.017	-0.030	-0.089
Output per worker (2011 PPP \$)	0.535**	0.380**	0.423**	0.188
Hours worked per week (per employed person)	0.130	0.116	-0.079	0.348**

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND INTERNATIONAL INTEGRATION

Exports and imports (% of GDP) has no relation with HDI in all four types of HD countries and similar fashion of relationship has been observed between HDI and foreign direct investment, net inflows (% of GDP) except in medium HD countries where it has inverse relations (r =-0.327, p<0.05). Private capital flows is positively associated (r = 0.297, p<0.05) with HDI in very high HD countries only. Net official development assistance received is the distributions of credits made on concessional terms (net of reimbursements of primary) and allows by authority organizations to advance monetary improvement and welfare in nations and regions on the Development Assistance Committee rundown of help beneficiaries, communicated as a rate of the beneficiary nation's GNI. It has strong inverse relationships with HDI across all the categories of HD nations. Remittances, inflows (% of GDP) is inversely related with HDI in high (r = -0.411, p< 0.01) HD countries while net migration rate (per 1,000 people) has positive association with HDI in very high (r =0.356, p<0.05) and high (r = 0.395, p<0.01) human developed countries. In addition, stock of immigrants (% population) has no significant relation with HDI in four types of HD countries groups. International student mobility (% of total tertiary enrolment) has positive association with HDI in very high (r = 0.295, p<0.05) HD countries while international inbound tourists (thousands) are positively associated with HDI in low (r = 0.498, p< 0.01) HD countries. Internet users (% of population) have positive impact over HDI across all the HDI grouped nations while Mobile phone subscriptions (per 100 people) are positively associated with HDI in medium (r = 0.534, p<0.01) HD countries only. In addition, Mobile phone subscriptions (% change) have negative relationships with HDI in low (r = -0.383, p<0.05) HD countries.

TABLE 10

Correlations of Human Development Index and International Integration

	HDI Nations			
	Very High	High	Medium	Low
Exports and imports (% of GDP)	-0.126	0.091	-0.100	-0.017
Foreign direct investment, net inflows (% of GDP)	0.022	-0.007	-0.327*	-0.295
Private capital flows (% of GDP)	0.297*	0.058	0.193	0.112
Net official development assistance received (% of GNI)	-0.336*	-0.473**	-0.350*	-0.484**
Remittances, inflows (% of GDP)	-0.198	-0.411**	0.052	0.056
Net migration rate (per 1,000 people)	0.356*	0.395**	0.115	-0.081
Stock of immigrants (% of population)	0.136	0.197	0.185	-0.179
International student mobility (% of total tertiary enrolment)	0.295*	-0.130	-0.121	-0.205
International inbound tourists (thousands)	0.273	0.215	0.223	0.498**
Internet users (% of population)	0.564**	0.473**	0.406*	0.587**
Mobile phone subscriptions (per 100 people)	-0.280	0.236	0.534**	0.243
Mobile phone subscriptions (% change)	-0.117	-0.014	-0.015	-0.383*

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND WORK WITH EXPLOITATION, RISKS & INSECURITIES

Child labour (% ages 5–14) and female & male home employees (% of total employment) are significantly inversely related with HDI in very high HD countries only. Working poor at PPP \$2 per day is inversely related with HDI in very high, medium and low HD countries while low pay rate (% of total employment) and Nonfatal Occupational injuries (thousands) are not associated with HDI in any type of HDI grouped countries. Redundancy welfares beneficiaries (% of unemployed ages 15–64) have positive associations with HDI in very high HD countries

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only while old age pension receivers are positively related with HDI in high and medium human development indexed countries.

TABLE 11

Correlations of Human Development Index Work with Exploitation, Risks and Insecurities

	HDI Nations			
	Very High	High	Medium	Low
Child labour (% ages 5–14)	-0.450**	-0.196	-0.195	-0.274
Female Domestic workers (% of total employment)	-0.299*	0.086	0.216	0.154
Male Domestic workers (% of total employment)	-0.287*	0.073	0.228	0.135
Working poor at PPP \$2 a day (% of total employment)	-0.355*	-0.128	-0.383*	-0.402**
Low pay rate (% of total employment)	0.102	0.004	0.288	-
Nonfatal Occupational injuries (thousands)	0.258	0.209	0.250	0.175
Fatal Occupational injuries (Cases)	0.264	0.244	0.418**	0.207
Unemployment benefits recipients (% of unemployed ages 15-64)	0.513**	0.222	0.243	-
Mandatory paid maternity leave (days)	-0.048	0.233	0.152	-0.090
Old-age pension recipients (% of statutory pension age population)	0.336	0.265*	0.337*	0.200

* p<0.05; ** p<0.01

IV. CONCLUSION

The recent eras have seen restored enthusiasm in understanding that how quality of life of people is attached with the human development and economic growth of countries. Human Development Index (HDI) is a combination of statistics used in measuring the human improvement level of any nation and to permit cross-country analysis. Several factors are attached with the human development and vary from low developed nations to very high developed nations e.g., life expectancy at birth, women empowerment, average years of schooling for male, public health expenditures, public expenditures on education, total tax revenues, research & development expenditures, taxes on income, profit & capital gain, domestic credit provided by financial sector, labour force participation rate, employment to population ratio, private capital flows, net migration rate, international student mobility and unemployment benefits recipients are positively associated with human development index in very high human development index countries. In addition, factors that are inversely related with HDI in very high human development index nations are average annual GDI growth, female & male adult mortality rate, external debt stock, total debt service, infant's mortality due to outdoor pollution, employment in agriculture, youth unemployment, male & female domestic workers and child labour

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TOWARDS UNDERSTANDING RELATIONAL ASPECTS OF INTER-ORGANIZATIONAL COLLABORATION: AN EXPLORATION OF PUBLIC-PRIVATE PARTNERSHIPS IN PAKISTAN

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Abstract. One of the most significant current discussions in the public management agenda over the last couple of decades is public-private partnerships (PPPs). Despite the positive rhetoric, huge efforts are required to reap the advantages of PPPs and overcome the many potential challenges. In meeting these challenges, it is important to understand and manage inter-organizational relationships (IORs) between the public and private sector organizations involved in a public-private partnership arrangement. However, 'limited scholarly attention has been devoted to the on-going managerial life of a PPP' (Weihe, 2010, p.510). This research paper contributes to a better understanding of the 'on-going managerial life of a PPP' by presenting an empirical study of educational PPPs in Pakistan.

Keywords: Public-private partnerships, Inter-organizational relationships, Educational PPPs, Primary education, Third sector, CARE, ITA

JEL classification:

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I. INTRODUCTION

Markets and hierarchy are often seen as distinct and opposing mechanisms for the provision of public services. However, due to increasing interdependence of various public and private sector organizations, the boundary between public and private sectors has become blurred (Pollitt, 2003). Public-private partnerships (PPPs) are situated on this boundary. PPP is a specific type of inter-organizational collaboration that is distinct in one fundamental way that it involves public-private interaction and thus 'demand[s] a specific and individual analysis' (Noble & Jones, 2006: 914). PPPs have been a hot topic of discussion during the last two decades or so (Bovaird & Tizard, 2009; Hodge, Greve, & Boardman, 2010; Osborne, 2000). There is an increasing tendency, both in the industrialized world and in developing and transitioning countries, to involve the private sector in public service delivery. Despite the positive rhetoric, huge efforts are required to reap the advantages of PPPs and overcome the many potential challenges (Huxham, 2003; Skelcher, 2005). In meeting these challenges, it is important to understand both structural and relational aspects of PPPs.

The formal and structural aspects of PPPs have been discussed in depth in the existing PPP literature. This includes discussion to explore the conceptual boundaries of PPPs (Klijn & Teisman, 2005; Klijn, 2010; Skelcher, 2005), analysis of the institutional design of partnership and modes of governance (Lowndes & Skelcher, 1998; Skelcher, 2010), designing contracts and allocating responsibilities, risks and rewards (Hodge, 2004), assessing economic worth (Boardman & Vining, 2010), investigating the relationship between democratic practices (e.g. public interest issues, accountability and transparency), design of partnerships (Skelcher, Mathur, & Smith, 2005), and discussing the outcomes of PPPs (Gazley & Brudney, 2007; Hodge & Greve, 2007).

It is argued by some PPP scholars that the dominance of this 'macrolevel' analysis has resulted in relatively limited scholarly attention to the 'micro-level' analysis of operational and relational aspects of collaboration (Noble & Jones, 2006; Weihe, 2010). This imbalance limits our understanding of the diverse and dynamic nature of relationships within PPPs. This research paper contributes to filling this gap by presenting an empirical study of PPPs in the education sector in Pakistan.

The paper presents an analysis of two in-depth case studies where two non-governmental organizations (NGOs) entered into separate PPP arrangements with the Government of Punjab. Their involvement was part of the government's 'Adopt-a-school' programme, which aimed 'to uplift the standard of education' in the adopted state schools. This paper presents and explores the different inter-organizational relationships (IORs) found in the two case studies. It then seeks to address the question of why these differences have emerged given that the two cases share the same policy context and, in theory, operate under the same policy model of partnership. Answering this question requires going beyond the structural aspects into the relational side and is important for better understanding of PPPs. The paper is divided into four sections. The *first* section outlines the conceptual framework used in the study, focusing on organization identity and mutuality as important dimensions for analyzing IORs. The second section explains the context in which PPP initiatives were introduced in the education sector of Pakistan and introduces two case studies where the state and private not-for-profit organizations have entered a PPP arrangement called 'Adopt-a-school' programme. The *third* section examines the dynamics of IORs in the 'Adopt-a-school' case studies. Style of management and leadership approach are identified as important factors influencing mutuality and the dynamics of IORs. The *final* section concludes by discussing the implications of the findings for theory and practice.

II. CONCEPTUAL FRAMEWORK

The concept of *'inter-organizational relationships'* (IORs) is sometimes viewed as an umbrella term to represent the organizational forms or structures that diverse partnership arrangements can take (J. M. Brinkerhoff, 2002; Huxham, 2003). IORs are also viewed from a process perspective (Levine & White, 1961; Ring & Van de Ven, 1994; Thomson & Perry, 2006). Here they are seen as 'the sequence of events and interaction among organizational parties that unfold to shape and modify an IOR over time' (Ring & Van de Ven, 1994: 91). Under the process perspective IORs are seen as the developmental process as opposed to the structural form these relationships take. This paper largely adopts a process perspective in analyzing IORs but acknowledges that it is often impossible to draw neat distinctions between structures and processes.

The existing literature on collaboration and partnerships provides different theoretical frameworks to encapsulate the complexity inherent in the variety and contexts of these relationships. This paper draws on the framework presented by Brinkerhoff (2002) to analyze IORs within partnership arrangements. Brinkerhoff (2002) has identified two dimensions as key to understanding IORs: *organization identity* and *mutuality*.

ORGANIZATION IDENTITY

The defining characteristic of PPPs is the dual identity that partners share: their own distinct organization identity and the partnership identity (Huxham, 1996; Thomson & Perry, 2006; Wood & Gray, 1991). This usually leads to tension between pursuing individual organizational goals and achieving partnership goals. Thomson and Perry refer to this tension as 'the process of reconciling individual and collective interests' (2006: 26) and it is a recurring theme in the existing literature on partnerships and collaboration. Brinkerhoff (2002, 2002b) examines organization identity at two levels. First is the organization's own mission, goals and constituencies and with respect to this the 'maintenance of organization identity is the extent to which an organization remains consistent and committed to its mission, core values and constituencies (2002: 23). Secondly, organization identity refers to the comparative advantages of the sector an organization belongs to. It is generally argued in the partnership literature that in order to reap the synergistic rewards of a partnership, it is essential to maintain these comparative advantages. Organizations which get involved in PPPs arrangements need to maintain their unique identities in the context of increasing interdependencies developing over time (Ring & Van de Ven, 1994). Partnerships are seen as an exchange relationship whereby each partner is chosen and assigned responsibilities according to the comparative advantage that each is presumed to contribute to the partnership. These exchange relationships are also discussed with respect to the strategic alliance literature (e.g. Levine & White, 1961; Ring & Van de Ven, 1994) and from a resource dependence perspective (Pfeffer & Salancik, 1978). Technically if organization identity is lost, comparative advantage is lost and there would be nothing unique on the part of that partner to contribute to partnership. In such a case there is no rationale for justifying the huge efforts required for partnership working.

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MUTUALITY

Mutuality refers to interdependence among partners in a partnership or similar arrangement (J. M. Brinkerhoff, 2002; Thomson & Perry, 2006). The social dilemma of individuals pursuing their individual welfare rather than the joint welfare has always been discussed as the main problem in the face of any attempts targeted at collective benefits (Olson, 1965; Ostrom, 1990). However, Ostrom (1998) has argued that it is possible to curtail the costs related to collective action by 'building conditions' that can help in dealing with difficulties of getting individuals to pursue collective interests. Mutuality acts as an incentive or motivating factor to enter into partnership arrangements and encourages partners to pursue collective goals by giving them a sense of ownership. This is usually done by providing opportunities for partner organizations to jointly determine the partnership procedures. This implies that mutuality helps to solve the collective action problem by providing partners with a mechanism to reconcile individual and collective interests (Thomson & Perry, 2006; Wood & Gray, 1991). Participative decision making, shared power arrangements, reciprocal accountability, transparency, information sharing, joint determination of programme activities and mutual respect are commonly used indicators of mutuality.

METHODS

The study consists of two case studies, Co-operation for Advancement, Rehabilitation and Education (CARE) and Idara-e-Taleem-o-Aaghai (ITA), both of which are NGOs and are selected mainly due to their prominence in the field. The information and analysis presented in the paper is based on 46 in-depth interviews conducted with the officials from both NGOs as well as the government officials including head teachers, senior teachers and district education officials. The interviews were recorded, transcribed and coded in NVivo. Some of the key documents such as contracts, terms and conditions, minutes of meetings and field notes from process observation were also imported into NVivo for analysis. A thematic coding approach was used and this enabled both deductive and inductive analysis to be undertaken simultaneously (Braun & Clarke, 2006). The research context of this empirical study is important for at least two main reasons. First, the developing country context provides an opportunity to study PPPs outside of the developed world and to test whether the models and frameworks developed in the west make sense in this context. Second, the existing PPP literature is skewed towards studying infrastructure PPPs. In contrast, this study considers PPPs for service delivery.

EDUCATIONAL PPPS IN PAKISTAN

The issue of access to quality education in Pakistan is crucial and like many other countries the provision of education services in Pakistan has undergone many changes during the last two decades. Developing countries often face significant educational challenges around providing access to schools and delivering quality education. Many countries, including Pakistan, have looked to the private sector to help overcome these problems (LaRocque, 2008; Patrinos, Barrera-Osorio, & Guaqueta, 2009). The government in Pakistan officially recognizes that the public sector on its own lacks all the necessary resources and expertise to effectively address and rectify low education indicators (Government of Pakistan, 2004). Since 2001, the government has undertaken many initiatives to mobilize all sectors of the society in the face of educational challenges. Many of these initiatives are geared towards improving service delivery in state schools through PPP agreements with the private sector (including NGOs)(GoP, 2003; Government of Pakistan, 2004). The 'Adopt-a-school' programme is one of the most prominent initiatives in which government departments form partnerships with private sector organizations and hand over the management of the state's underperforming schools to the private sector for a specified period of time under a Memorandum of Understanding (MoU). The programme has received national recognition and is in practice in all four provinces of the Pakistan.

DYNAMICS OF IORs

The two cases, though share several similarities such as both are not-forprofit NGOs operating in the context of the same country apparently under the same model of partnership, illustrate diversity in terms of IORs. In this section the identified dimensions that are recurrent in both partnership and collaboration literatures are operationalized using

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empirical data which offers an insight into the dynamics of IORs in practice. For this purpose, the cross-case analysis of both NGOs is undertaken to identify the reasons for diverse IORs in case of both NGOs.

OPERATIONALIZING PARTNERSHIP DIMENSIONS: *ORGANIZATION IDENTITY AND MUTUALITY*

The IORs between state and NGOs in 'Adopt-a-school' programme are quite formal and based on the MoU. The fact that there is no standard MoU developed by the state education department for the said programme provides a greater space to the private sector partners to envision the goals of partnership as well as the roles and responsibilities they wish to pursue to achieve these goals. It becomes evident by analyzing the two case studies presented in the paper that both NGOs have managed to preserve their respective organization identities by taking lead in developing the MoU which is carefully crafted to maintain and protect their individual distinct organization identities.

Nevertheless, public sector ensures the maintenance of its organization identity by making it necessary for private sector partners to ensure consultation with the government officials at several points and keeping them informed about the state of adopted schools. This ensures maintaining the respective unique identities of both public and private sector partners in a PPP arrangement 'in the face of growing web of interdependencies that emerge with time' (Ring & Van de Ven, 1994: 108).

The fact that partners share a dual identity — their individual distinct organization identity and collective identity within the partnership—leads to tension between both identities (Huxham, 1996; Thomson & Perry, 2006; Wood & Gray, 1991). The goals of partnership under 'Adopt-a-school' programme are very broad making it difficult to define them precisely. The goal of partnership is *'to uplift the standard of education'* and seems that any private sector partner could contribute anything towards improving the standard of education in the adopted schools. The lack of precise clarity in the goals of partnership coupled with no formal training or even guidelines by the government education department to those adopting state schools results in different subjective perceptions about achieving the goals of the partnership guided by their individual

organization identities. Hence, partnership management and implementation is generally dependent on the *organization identity* of the private sector partner working in state schools and varies to great extent from one partner organization to another.

In order to illustrate tension in the perceived goals of partnership the paper draws an analogy to categorize inputs for the delivery of education. Two terms have been adopted from computer system for this purpose; *hardware* and *software* inputs. Hardware in computer language refers to 'the collection of physical elements that comprise a computer system' and software means 'a collection of computer programs and related data that provides the instructions for telling a computer what to do and how to do it'(Microsoft, 2013).

For the purpose of this paper these terms are used in education system are quite analogous to the computer system¹. The term *hardware* (very much parallel to its use in the computer system) refers to the collection of physical elements that comprise an education system and would include infrastructural facilities such as building, class rooms, library, labs, provision of missing facilities such as drinking water, toilets, fans, furniture, technical facilities such as computers, overhead projectors, multimedia etc., support facilities such as textbooks, stationery, uniforms etc. and also comprise provision of teachers². *Software* in this context refers to the services in relation to delivery of education itself and would comprise of designing and providing curriculum or any other learning material for teaching, training of

¹ This division between *hardware* and *software* inputs, however, is not intended to argue the non-relevance of *hardware* facilities or undermine their contribution for education service delivery. In fact, the provision of *hardware* inputs are the prerequisites for the effectiveness of software inputs. Even in the computer language no software can be installed unless and until it is supported by the required hardware.

² Provision of teachers though appears to be *software* input could be argued as *hardware* input as teacher refers to the physical element that comprises an education system. Therefore, under this analogy provision of teachers would be considered as *hardware* input while activities aimed at the improvement of quality of teaching (such as training of teachers, monitoring teachers in class rooms, evaluating teachers' lesson planning and copy checking) would be referred to as *software* inputs.

teachers and staff, monitoring teachers in class rooms, examining the notebook checking done by teachers, introducing mechanisms for quality improvement such as lesson planning, monthly exams to asses children learning, keeping a track record of child learning outcomes, implementing stated rules and regulations etc.

Both CARE and ITA have distinct goals that are explicit both in the MoUs and in practice as observed during the fieldwork. In case of both case studies, the NGOs did not give autonomy to public sector partners in determining the micro-level goals of partnership. There is of course, the macro-level mutually determined goal of the PPP that is 'to uplift the standard of education' but the operationalization of this macro-level goal was left on the part of private sector partners by the state.

In case of CARE, 'to uplift the standard of education' primarily means to improve management of the state adopted schools and improve the learning levels of children. This is the reason that CARE takes on the management responsibility of the adopted schools as mentioned in the state-CARE MoU:

> Management of the entire affairs of the above-referred schools shall exclusively vest in CARE... subject to the overall supervision and control of the "District Government" within the formalities of this agreement (State-CARE MoU).

Furthermore, CARE takes the responsibility to:

evaluate and prepare appraisal reports for all including Government staff. Such performance & evaluation reports about the performance of Government staff would carry reasonable weight and importance both in CARE and District Government Education Department (Clause 18, State-CARE MoU).

As a result, their main emphasis is on the provision of *software* inputs such as:

• regular monitoring of schools, record keeping and data management including attendance records, movement register, teacher evaluations, minutes of meetings etc. and sharing information with relevant district officials;

- taking initiatives to improve discipline at schools such as establishment of school committees, day master/mistress duties;
- obliging government teachers to use CARE supplements which are designed to improve teaching pedagogy;
- providing CARE teachers to overcome shortage of teachers;
- capacity building by providing training opportunities to teachers and staff;
- monitoring teachers in class rooms;
- conducting centralized examination in all schools to assess learning outcomes of children;
- introducing mechanisms for improvement in learning outcomes such as lesson planning, keeping a track record of child learning outcomes;
- running summer camps to actively engage students in studies and co-curricular activities; and
- conducting English classes after school in selected adopted schools to improve spoken and written English of students.

Nevertheless, the fieldwork shows that besides a lot of *software* inputs provision, in practice CARE has refurbished and provided many missing facilities in adopted schools including construction of classrooms, libraries, science labs, furniture toilets etc. and CARE officials proudly refer to this as 'going way beyond the contract'. Due to their established rights to manage the adopted school under the MoU, the specifics of the programme are designed *a priori* by CARE in light of their mission and goals and not much mutuality is seen on the ground with respect to planning and designing these interventions. Nevertheless, there is evidence of joint decision making and joint determination of programme activities at points when these pre-determined interventions are going to be implemented in schools.

On the other hand, ITA envisions management of adopted state schools as a *joint* responsibility of the state and ITA clearly mentioned it in the state-ITA MoU:

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Management of the entire affairs of the above referred (adopted) school(s) shall mutually vest in CDG and the NGO... subject to overall supervision and control of CDG (City District Government) within the formalities of the agreement (Clause 28 i, State-ITA MoU).

This is so because for ITA, 'to uplift the standard of education' broadly refers to the provision of technical support to the adopted state schools and creating a 'safe learning environment through school rehabilitation' (ITA, 2012a). The interventions undertaken by ITA include:

- Capacity building by providing training opportunities to teachers and staff,
- community mobilization;
- provision of teachers;
- encouraging safe learning environment by providing missing facilities;
- creating awareness and sensitivity about health and hygiene, and environment issues;
- encouraging and involving children to take part in project based learning and co-curricular activities through 'summer schools';
- providing technical support on child friendly schools (CFS) and Early Childhood Education (ECE);
- designing and providing supplements to improve pedagogy;
- provision of ECE kit, health kit with first aid box, sports kits, reading kit;
- provision of uniform, school bags, books and stationery; and
- promoting literacy for mothers and siblings.

These interventions are implemented largely through 'timely resource mobilization' from diverse sources. Working with state education department increases the credibility of ITA and enables ITA to capitalize resources from multiple channels including community, corporate sector, philanthropists, expatriates and many multilateral and bilateral donor organizations. ITA has always strived towards its role in 'influencing of public policy' which is stated explicitly as a part of its mission statement. Getting into partnership relationship gives ITA the required influence to assert policy influence by gaining the knowledge about grassroots issues. Drawing on ITA's Provincial Programme Coordinator:

See if you want to do advocacy at macro level you can't do it until you have knowledge of grassroots level and what people actually do at grassroots level...and get to know their local issues and problems... secondly if we want the government to improve quality of education in government schools then we need to show government the best practices there and suggest the government to replicate it, so that's the advocacy (ITA-Provincial Programme Coordinator).

It would not be wrong to say that for ITA this PPP has served as a vehicle to travel the distance between service delivery at grassroots level to policy advocacy at the provincial and federal government level. Like CARE the interventions undertaken by ITA lack mutuality as they are decided *a priori* by ITA. ITA involves state officials at points where the project is already in the final form to be implemented and there is not much input from their side in project design and planning. Rather the emphasis is on getting approval to implement the projects in state schools and keeping them informed about what ITA is doing in partner school.

From the interviews conducted with the public sector officials it could be established that for them, generally speaking, the standard of education could be improved by undertaking infrastructure improvements, providing furniture, science labs and computer labs, addressing shortage of teachers and providing some training opportunities to teachers. The comment below is quite typical explaining the perceived need of the partnership especially the role of the private sector partner:

> What we need from partnership is that in order to provide quality education we get AV aids, give us multimedia, give us IT lab, give us IT teachers, give us sweepers where required, give learning based toys to children, things like that. We don't need interference, they should give us one trainer who should come after a month or 15 days and train in art and craft, activity based

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learning, doing art work and how to decorate the school. That's it! this is what we want (District government official).

From the above excerpt and several other similar examples that could be quoted, it becomes clear that getting into partnership with the private sector organizations through 'Adopt-a-school' programme was perceived as an opportunity to 'to uplift the standard of education' by addressing lack of facilities in state schools by state officials.

This is reiterated by looking at the indicators of education improvement taken into account in the annual education statistics undertaken by the Government of Pakistan (GoP, 2011). The key indicators used to measure the quality of education system in this report are number of schools, enrolment figures, number of teachers and availability of physical facilities such as availability and ownership of school buildings, condition of school buildings, level of construction work, availability of electricity, drinking water, toilets and boundary walls, and number of classrooms (GoP, 2011: v).

This indicates the importance given to the provision of hardware inputs by the government officials which shapes the dynamics of IORs in practice. The role of the adopter with respect to achieving the goals of the partnership is primarily seen as that of a resource provider and facilitator to bring improvements in the school by providing hardware inputs. While the lists of interventions mentioned above undertaken by ITA and CARE have significant overlaps, the field research shows that besides a lot of commitment and generally more emphasis on the provision of *software* inputs, ITA keeps providing hardware inputs more frequently and is generally appreciated for that by the government officials. The interventions undertaken by CARE which are directly aimed at improving management of the schools and enhance learning levels of children are generally seen as stepping into the government officials' territory. This clash in perceived need of partnership between CARE and government officials becomes a reason of conflict and acts as a barrier in building IORs. The following comments by one of the CARE area manager summed up the difference in the perceived goals of the partnership:

If you call a DCO (district official) and even if you call chief minister he will come and see whether cleanliness is there, are teachers in the classes, if yes, that's perfect for them... they are not concerned with what the child has done in the notebooks and how much he has learnt, they think if cleanliness is there in school and teacher is in the class that's all. Whereas CARE says that work starts after all this is done, like for example you should conduct their trainings that how to teach and how to move ahead.

Along with reflecting on the differences with respect to the perceived goals of partnership, this quote is an example of CARE officials commonly-held belief that it is the provision of *software* inputs that is more important and that the state monitoring system is not targeted at the right indicators.

Although CARE supports adopted schools by providing *hardware* inputs, it takes provision of software inputs more strongly on board and adopts more direct approach while providing such inputs as compared to the enabling approach undertaken by ITA. The next set of factors deals with the organizational characteristics especially *style of management and leadership approach* which takes some of these ideas further by emphasizing the impact of these factors on mutuality and hence the dynamics of IORs. These factors emerged as prominent inductive themes, though established in partnership and collaboration literatures, while analyzing the qualitative data collected for this research.

STYLE OF MANAGEMENT AND LEADERSHIP APPROACH

Mutuality in case of 'Adopt-a-school' programme is strongly influenced by two types of factors: first, the organization identity of partners especially the mission and goals or 'what is it that they want to achieve', and second important set of factors influencing mutuality in 'Adopt-aschool' programme are the organizational characteristics especially *style of management and leadership approach* which were found to be very different for both NGOs explaining differences in mutuality and thereby influencing IORs. Table 1 demonstrates the comparative analysis of both NGOs across their approach towards programme management and leadership approach and provided useful framework to figure out the reasons for diverse IORs for both NGOs.

TABLE 1

Comparative Analysis of Programme Management and Leadership Approach

	CARE	ΙΤΑ
Day-to-day programme management	A full time Internal Coordinator (IC) appointed for each school	An Education Promoter (EP) required to visit each school almost once a week
Selected mechanism to fulfil government reporting requirements	Quite direct: regular monitoring of schools, record keeping and data management including attendance records, movement register, teacher evaluation etc. and sharing information with relevant district officials	Mainly indirect: The EP collects data including attendance records, enrolment and quality of teaching in the form of staff statement from the head teachers of the adopted schools which is then shared with the district officials
Responsibility for school management	Strongly taking management responsibilities under the MoU as well as in practice.	School management, though mentioned as <i>joint</i> responsibility of district officials and ITA under the MoU, usually considered as government responsibility in practice.
Involvement of government officials in planning and designing the interventions	Very limited, interventions usually designed <i>a priori</i> .	Very limited, interventions usually designed <i>a priori</i> .
Involvement of government officials while implementing interventions	Strong evidence of joint decision making and joint determination of programme activities in the implementation phase	Seeking approval from government officials (including head teachers) before implementing in schools
Conflict resolution	Opts to solve problems by taking discussion route but staying firm on their own standpoint. Matter taken to the higher levels of government if not resolved with discussion at school	Opts to resolve conflicts by taking discussion route with open mind rather than making it a dispute and taking it to higher levels of government
Leadership approach	Mainly direct (towards collaborative thuggery)	Mainly facilitative (from the spirit of collaboration)

It is clear from the table above that CARE while taking on the responsibility of the management of the adopted schools and undertaking performance evaluations of all including government staff, takes a more direct and authoritative approach in programme management. CARE takes pride in the work it has undertaken in the adopted schools and considers it as their main strength to improve management of the schools for which it heavily relies on monitoring (such as direct observation of teachers in classrooms, record keeping and data management etc.). An Internal Coordinator (IC) is appointed by CARE in each adopted school who is CARE employee and is given both teaching and management responsibilities at the school level. Although the IC is required to work under the supervision and in collaboration with the school head teacher, (s)he is often seen as interference by the district officials especially the head teachers of the adopted schools. This is due to the job description of the ICs especially their responsibility to evaluate and prepare appraisal reports for the government staff, which requires them to observe both CARE and government staff closely while they are at work.

In case of ITA, on the other hand, although considered joint in the MoU, most of the management responsibilities reside at the discretion of the government head teachers in practice and the ITA staff is only to solve any problems that could not be handled by the head teachers. As the Provincial Programme Coordinator of ITA commented:

The coordinators visit a school on weekly or monthly basically, the purpose is not that they go and sit there to see each and everything. Our coordinators' purpose to visit school is to see the follow up of the major issues of the school that were observed in their last visit... and (to see) the current problems of the schools. Basically we say that it is the government's responsibility to run the school and we target those areas (of work) where there is no expertise of government (staff) and give support in those (ITA-Provincial Programme Coordinator).

As clear from the above excerpt that the Provincial Programme Coordinator was convinced that it is state's responsibility to manage the schools and ITA supports in matters where they are unable to handle themselves. He gave an example: If there is some problem with the funds of school council that funds are not being transferred in the bank account then our representative is there to provide support and all other issues of this type where government people feel helpless, we are there to provide support (ITA-Provincial Programme Coordinator).

The enabling and facilitative approach is quite visible in the programme management and implementation by ITA whereby an Education Promoter is appointed by ITA who is responsible for 6-20 schools and is required to facilitate the head teachers and other staff of the school and is required to visit quite occasionally (usually once a week as seen in the fieldwork). As mentioned earlier that it is clear from the analysis of the state officials' interviews that the NGO's main responsibility is perceived to pump in hardware inputs and not to intervene much in their domain. That is why the direct role of the IC, in case of CARE, is often considered as stepping into the territories of the head teachers and acts as a barrier in building IORs.

Most of the head teachers in ITA partner schools appreciated that ITA doesn't interfere much while provide resources for the improvement of the school. While comparing CARE and ITA, one of the head teachers expressed her opinion as:

> I know CARE has adopted many government schools but comparatively ITA is far better than CARE, as whenever we heads meet with each other and have discussion, we get to know that ITA is far better than CARE.

In her opinion, in CARE adopted schools 'IC sticks to the school and they observe teachers while they are taking classes which is distracting for teachers' whereas ITA's Education Promoter comes once a week and seeks her permission to visit classes. Such type of comments is quite typical and reflect that ITA was quite successful in building IORs by adopting more of an enabling and participative approach rather than an authoritative and direct approach taken in the case of CARE.

Leadership approach is also found to be an important factor that strongly shapes the IORs in 'Adopt-a-school' programme. Murray (1998) while taking about organizational factors affecting collaborative efforts have argued that the 'attitude of leaders' towards collaborative arrangements is key and influences the 'readiness of the rest of the organization'(1998: 1194). The leadership at ITA has firm belief in the policy of no confrontation which is integral to ITA's working. ITA job descriptions explicitly mention under personal traits that to be eligible to work for ITA a person should be humble, hardworking and committed and 'able to develop cordial working relationships' with relevant government officials (ITA, 2012b, 2012c). It would not be wrong to say that this is the most significant factor in building IORS in case of ITA. All the head teachers interviewed during this research generally reflected positively about ITA's way of conduct. Collectively, statements such as:

'ITA deals with us in a very good way ... I think when people join ITA, the first policy they have is good behaviour'

'they do it in a very good and friendly way and give a lot of respect...

'whenever I discuss something with the EP or the district manager, they are so polite that I don't like to create any conflict with them and they deal in such a nice way and talk in a very good way'

'if we don't like something we tell them and they listen to us and agree with us and also drop it'

would suggest that ITA mainly enacts leadership *from the spirit of collaboration* (Huxham, 2003; Vangen & Huxham, 2003) by the means of its policy of no confrontation, engaging and embracing the head teachers and other staff of the school with respect and solving minor problems through discussion with open mind helps. Such approach is a factor to explain building IORs at the grassroots level.

Mutual respect was quite prominent in case of ITA whereby ITA officials while discussing their interventions with government officials were found to be quite flexible to change or even drop their interventions in case of critical incidents when there is no agreement on it from the school side. In case of any conflict at school level, ITA opts to solve problems by taking discussion route rather than making it a dispute and taking it to higher levels (evidence of acting *from spirit of collaboration* perspective).

The CARE case study provides many examples in which both *spirit* of collaboration (facilitative) and collaborative thuggery (directive) roles

are seen in practice. The leadership at CARE, like ITA, seem to adopt the policy of no confrontation and no criticism. The leader of CARE, for instance, deemed that:

'we have always tried to make everyone a team... and also we made a policy right from the start... we made it no confrontation and no criticism'

Nevertheless, she emphasized that:

'but I told them we need to stand in here; we are here to serve our children'

which elaborates that besides such policy of no confrontation the CARE officials stick to their point of view and keep on pursuing their mission. This implies that CARE officials Therefore, they keep convincing the government officials including head teachers by getting into frequent discussions as CARE Head of Management added in her interview:

The problems and hindrances keep on appearing but we overcome them with communication. It is not like there are no problems, there are many but we don't take them as problems and stick to our aim and then they don't remain a problem for us.

Moreover, CARE ICs are frequently seen maneuvering the head teachers to get them to the course of action they want them to pursue. As observed in the fieldwork the CARE ICs made things happen through *manipulating the agenda* and *playing the politics* (Vangen & Huxham, 2003). For example, in a case narrated by a CARE IC the government teachers and head were reluctant to take 'zero period' which was introduced by CARE to give extra time to students before the starting time of school. It was especially aimed at children who were about to appear in the board exams. She explained:

We handle them in their own ways and tell them see if we don't take zero periods children are so weak they will fail and your result will be bad and it will affect your ACR. She also tries to listen but the thing is that we also prefer ma'am (the head teacher) in every matter, we do ask her and discuss everything with her.

The above comment is an example where CARE IC managed a complex situation by carefully *playing the politics* (preferring the head
teacher as she is the one who has power and is worth to bother) and hence *manipulating the agenda* (imposing her understanding of the issue and deciding on her behalf about how to improve the exam results), what is referred to as *towards collaborative thuggery* by Vangen and Huxham (2003). In case of CARE, the fieldwork supports frequent discussion with the government officials at both school and higher levels. However, most often CARE officials stick to their own point of view and keep on convincing the head teachers by getting into discussions. There are cases when such conflicts turn into major disputes. In such situations CARE officials take matters to the higher levels of government to get them resolved (evidence of being adept *towards collaborative thuggery* perspective).

This leadership approach taken by CARE officials (guided by the organization identity especially mission and goals) is deemed differently by different head teachers. At one extreme it is considered total interference on part of CARE while on the other extreme there are cases where head teachers acknowledge CARE's contribution in uplifting the standard of school. However, the IORs tend to be similar across different head teachers in case of ITA due to its programme management and leadership approach undertaken by ITA.

III. CONCLUSIONS & IMPLICATIONS

This paper has examined IORs within selected PPP arrangement, 'Adopta-school' programme, along the dimensions of *organization identity* and *mutuality* which are often discussed as key dimensions that signify partnership activity. It has been found that these two dimensions are interdependent and that one dimension is influenced by changes in the other dimension. While it is important to reach the higher levels on both these dimensions to reap the synergistic rewards of a PPP as suggested by the partnership scholars (J. M. Brinkerhoff, 2002; Thomson & Perry, 2006), the case studies illustrated the practical challenges associated with this phenomenon. The analysis presented in this paper identifies the dilemmas and tension that confront partners with respect to maintaining their individual organization identities whilst simultaneously establishing mutuality. In order to preserve their respective comparative advantages and thereby maintaining their organization identities, the programme management and type of interventions in case of both NGOs reflected their own distinct organizational mission and goals. This somehow affected the degree of mutuality in the partnership as much of the specifics related to manage the partnership working in practice were found to be determined a priori without much participation of the government officials.

Given the lack of clarity in the goals of partnership in 'Adopt-aschool' programme, the mission and goals of the partnership (collective identity) as perceived by the partners is strongly influenced by the mission and goals of the individual organizations (individual identity) of the partners. This illustrates the 'the process of reconciling individual and collective interests' (2006: 26) which is a recurring theme in the existing literature on partnerships and collaboration. Ostrom's collective action perspective could be used as a useful framework to seek a balance among the dimensions of organization identity and mutuality, as the actors in PPP arrangement constantly face challenges to solve the collective action problem of 'how to change a situation from one in which appropriators act independently to one in which they adopt coordinated strategies to obtain higher joint benefits or reduce their joint harm'(Ostrom, 1990: 39).

Both NGOs sought some degree of mutuality by involving government officials in discussions while implementing the interventions which were designed a priori by them. Both NGOs strived to build IORs by adopting the policy of no confrontation with the government officials. While practicing such policy ITA operated mainly from the spirit of collaboration while CARE officials were found to practice policy of no confrontation contingently from the spirit of collaboration whilst drawing on *collaborative thuggery* at the same time (Vangen & Huxham, 2003). This fundamental difference in the leadership approaches adopted by the NGOs influenced the choice of mutuality indicators. The analysis of the empirical case studies established that amongst various indicators of mutuality discussed in the existing literature, different organizations pick and choose the ones that suit their goals and style of management. This implies that not all of the indicators are sought in a given PPP arrangement. Some of the indicators are ignored while others become prominent in order to pursue mutuality in partnerships.

It is clear from the analysis that IORs in 'Adopt-a-school' programme is influenced by the organization identity and mutuality within partnerships and these dimensions are interrelated and keep on influencing each other in an iterative manner. The individual organization identity of partners has an impact on the way in which partners pursue the collective organization identity of the partnership. The organization identity - both individual and collective - then determine the degree of mutuality in partnerships as 'embedded in mutuality is a strong mutual commitment to partnership goals and objective' (J. M. Brinkerhoff, 2002: 22). Mutuality enables to maintain, and indeed to promote, the organization identity by providing a mechanism to reconcile divergent goals and objectives of the partners (Jennifer M. Brinkerhoff, 2002; Thomson, Perry, & Miller, 2009; Wood & Gray, 1991). The analysis also highlights that mutuality is strongly influenced by the style of management and leadership approach taken by the actors within this PPP arrangement. Hence, the analysis supports that both organization identity and mutuality (influenced by the style of management and leadership approach) are key dimensions shaping IORs in PPP arrangements in practice.

This paper was an attempt to analyze the dynamics of IORs within the selected PPP arrangement. Identifying the factors that explain the difference in IORs is the first step towards understanding the dynamics of IORs. The paper generally seeks to answer the research question by adopting a comparative approach. Such comparative analysis is helpful to answer the overarching research question for this paper as to why initiatives which are in the context of the same country and apparently under the same model of partnership are still quite diverse in terms of the IORs. As already established in the existing literature that IORs are dynamic in nature and these cannot be designed and determined *a priori* to develop and behave in specified ways (Thomson & Perry, 2006; Weihe, 2010; Wood & Gray, 1991). Rather they are 'socially contrived mechanisms' that are continuously 'shaped and restructured' by the actors involved (Ring & Van de Ven, 1994: 96). Having said this, however, a note of caution should be mentioned to this analysis. It is yet to be explored in the context of this research that how these IORs vary over time under different situations. Underlying these heuristics is a more complex set of formal and informal processes (Ring & Van de Ven,

1994) that go on and explain how, why and what types of IORs emerge through various interactions among the actors involved in partnership arrangements.

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SUSTAINABILITY: AN IMPERATIVE FOR IMPROVING GOVERNANCE AND MANAGEMENT IN PAKISTAN

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Abstract. Sustainability remains an elusive goal in Pakistan. While there have been a plethora of policies, frameworks and blueprints for sustainable development with grandiose targets and optimistic timelines, Pakistan suffers from severe lags in implementation of development plans, due to ineffective monitoring and flaws in evaluation of projects (Kakakhel, 2011). This paper starts with a contextual review of the Pakistan's governance issues, business environment and efforts for sustainable development. This is followed by literature review for presenting discourse on the sustainability paradigm, reflexive governance and corporate social responsibility. The theoretical perspectives presented in extant literature are used to analyze three important sustainability initiatives in Pakistan. Finally, recommendations are presented for development planners and managers of public and private organizations regarding practical uptake and mainstreaming of sustainability approach in Pakistan.

Keywords: Sustainable development in Pakistan, Sustainability, Reflexive governance and corporate social responsibility

JEL classification:

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I. INTRODUCTION

Sustainable development has a new agenda as laid out by UN Synthesis Report: The Road to Dignity by 2030, calling for rethink and redesign of development policy frameworks Post-2015 (Ki-Moon, 2014). Instead of relying on a segregated approach to development, this agenda of global development supports an integrated and self-reinforcing approach to economic, social and environmental concerns. Inclusive policies fostering economic growth have positive environmental spillover effects which, in turn, leverage social progress. Strong inter-dependence and inter-linkages exist between the three aspects of sustainability.

Given this linkage, it is not surprising that in Pakistan serious governance challenges have not only hampered economic development and policies to reduce poverty but poor governance has also negatively impacted the investment climate, undermining competitiveness of private firms and making it harder to attract foreign investment. Transformational change in the country would require private sector involvement in public sector reforms, out of the box thinking, integrated solutions, utilization of human resource and sustainability consciousness.

II. SITUATIONAL ANALYSIS

Sustainability remains an elusive goal in Pakistan. For unleashing the development potential of the country, optimal utilization of strategic endowments is required which is not possible without improving governance and management quality. Unfortunately, most of the reputable governance and business competitiveness indicators suggest that Pakistan is facing grave governance and management challenges (WGI, 2015; WEF 2015). The government has limited capacity to achieve durable development outcomes (World Bank, 2015). Even in the private sector, the number of companies with well-defined sustainability policies and awareness of sustainability reporting is low (PIGC, 2013).

III. PAKISTAN'S GOVERNANCE ISSUES AND BUSINESS ENVIRONMENT

Pakistan's governance issues are grave and alarming. The Worldwide Governance Indicators project report (WGI, 2015) reveals that in 2014 Pakistan was ranking lower than the South Asian average in terms of all six indicators of governance. The greatest governance challenge, as expected for a country going through internecine war, remained 'Political Stability and Absence of Violence/Terrorism'. Among the 215 global economies included in this project Pakistan ranked 208th, with only 7 countries being worse off on this dimension. According to the report, 'Control of Corruption' was the next severe challenge for good governance. Although after the political regime change in 2013, minimal improvements were noted in this area. Nevertheless, Pakistan stood at the 21.6th percentile rank, where as its neighbor India achieved 38.94th percentile, during the same time period. On the dimensions of 'Voice and Accountability' and ' Rule of Law', Pakistan's score was lower than that of its once constituent part- Bangladesh. In terms of 'Government Effectiveness', Pakistan lost a percentile rank as compared to its performance in 2013.'Regulatory Quality' appears to be the only silver lining, with an improvement of 3 percentile ranks as compared to the year before and the highest rank being scored in this dimension as compared to the other five indicators of governance (WGI, 2015).

TABLE 1

Pakistan's Global Competitiveness Indicators 2015: Areas of Extreme Weaknesses and Relative Strengths

Pillar	Extreme Weaknesses	RANK*	Relative Strengths	RANK *
Institutions	Business Costs Of Terrorism	139	Investor Protection Laws	21
	Organized Crime	132		
	Reliability Of Police	126		
Infrastructure	Quality Of Electricity Supply	129	Quality Of Roads	60
Health & Primary Education	Infant Mortality	134		1
	Primary Education Enrollment	134	HIV Prevention	
Goods Market Efficiency	Trade tariffs, % duty	137	Tax Rate % Profit	50
	Imports as a percentage of GDP	132	Buyer Sophistication	78

Pillar	Extreme Weaknesses	RANK*	Relative Strengths	RANK *
Labor Market Efficiency	Women In Labor Force Ratio To Men	136	Hiring & Firing Practices	48
	Cooperation In Labor Employer Relations	131		
Market Size	Exporters Percentage Of GDP	137	GDP(PPP)	26
Innovation	Patent Applications Per Million Population	109	Availability Of Scientists & Engineers	44

* (RANK Out of 140 Economies) **Source**: Compiled from Global Competitiveness Report 2015 (WEF 2015)

Governance ineffectiveness in Pakistan is also reflected in poor performance of private sector as revealed by the Global Competitiveness Report 2015 (WEF 2015). Pakistan was placed at 126th rank among 140 countries, showing paucity of long-term structural reforms for boosting productivity and unleashing entrepreneurial talent. Among the South Asian Association for Regional Cooperation (SAARC) member countries, it is no surprise to find India leading the way with 55th position in overall industrial competitiveness. However, it is disheartening that Pakistani business situation is even worse than Nepal (100th rank), Bhutan (105th rank) and Bangladesh (107th rank).

According to the report Pakistani business persons identified corruption as the most problematic factor for private sector in Pakistan followed by 'Tax Rates'. From Table 1 the first perception is corroborated as despite having a reasonably high GDP, Pakistan's health and education indicators are abysmal, suggesting the presence of corrupt authorities. That some business people may be part of this corrupt group is suggested by the second perception. If 'Tax Rates' are such a big problem, how can it be that tax rate as percentage of profit is relatively low as compared to the rest of the world? It is clear that Pakistan is a country with a lot of economic and human resources, but transforming the living conditions of an average Pakistani would require re-conceptualization of the development agenda.

PLANNING FOR SUSTAINABLE DEVELOPMENT

There has been a plethora of policies, frameworks and blueprints for sustainable development in Pakistan with grandiose targets and optimistic timelines. Yet the country suffers from severe lags in implementation of development plans, due to ineffective monitoring and flaws in evaluation of projects (Kakakhel, 2011).

As early as 1953 a National Planning Board (made into the Planning Commission since 1960) was set up in Pakistan for socio-economic development planning and decision-making. Five years' development plans were formulated. Subsequently 'Perspective Plans' of 10 years or longer duration were also presented. Of the 10 five year plans presented between 1955 and 2013, only the second and third met substantial success. The status and effectiveness of the Planning Commission has also been changing. The Commission was the "nerve centre" of policy making during the Ayub Khan era (1958 – 1969). Zulfigar Ali Bhutto's tenure (1971 - 77) was a "No Plan" phase, and the status of the Planning Commission declined. Subsequently, the commission's role is recovered but its former status as independent, apex advisory body has come under challenge.

Since early 90s, a new generation of medium-term development planning instruments and policy reform packages have been produced in Pakistan, some at the government's own initiative but largely donorprescribed. These include National Conservation Strategy (NCS), 1991; Interim Poverty Reduction Strategy Paper (I-PRSP), 1997; The Poverty Reduction Strategy (PRSP) – Dec. 2003; The Second Poverty Reduction Strategy Paper (PRSP II), 2007; Medium Term Development Frame work (MTDF), 2005-10; Pakistan in the 21st Century: Vision 2030, 2007; Framework for Economic Growth – Pakistan (2011); National Sustainable Development Strategy 2012.

Pakistan has had to develop many of these 'Reform Packages' as conditionality in return for financial support, from the IMF and the World Bank and none have been fully and effectively implemented. It can therefore be said that planning for sustainable development has remained largely unproductive.

ENVIRONMENTAL CHALLENGES AND PROTECTION EFFORTS

Water, air, and soil pollution is rampant in Pakistan, and efforts at reversal of forests depletion, lakes, and mangroves are inadequate. On the other hand, Pakistan's vulnerability to the negative effects of climate change has become a major concern. Conservative estimates suggest that Pakistan's environmental degradation costs are no less than 6% of the GDP and these costs impact more upon the poor (Martin et. al, 2006).

At the same time, Pakistan has ratified and sought to implement fourteen multilateral environmental agreements (MEA's), and actively participates in global environment-related events like Commission on Sustainable Development (CSD) and the Governing Council of UNEP. Legal and institutional arrangements for environment protection have been put in place. These include establishment of environmental protection agencies (EPA's) at federal and provincial levels, National Conservation Strategy (NCS) in 1991, Pakistan Environmental Protection Act (PEPA) 1997, Certification of Environmental Laboratories Regulations (2000), the Revised Environmental Quality Standards (2000), the Pollution Charge for Industry Rules (2001), the Pakistan Biosafety Rules (2005).

The ground reality is that these ever growing environment-related institutions are inadequately financed, poorly staffed, mismanaged, insufficiently coordinated and suffer from lack of oversight. In their present form these arrangements are incapable of controlling the imprudent and unsustainable use of natural resources and growing dangers of pollution (Kakakhel, 2011). This being one of the greatest hurdle for sustainable development in Pakistan.

SOCIAL SECTOR ISSUES AND PROSPECTS

The Human Development Index placed Pakistan at 146th rank out of 187 countries in 2014, having the lowest social indicators in South Asia (HRD, 2015). Completion rate for primary education and public spending on health are the most severe challenges. Significant gender gaps in education, health and employment persist despite slight improvements in some areas. While official statistics claim reduction in poverty, rural populations remain highly vulnerable due to crisis in agricultural sector. Pakistan's low human development indicators negatively impact its labor force productivity and sustainable development potential.

A combination of unfavorable internal and external developments may have undermined the efforts of successive governments to improve social equity. These include socio-political turmoil, militancy, exponentially high population growth, rapid urbanization, natural disasters and global economic recession. There is need to extending social protection and safety nets for the poorest and improve the quality of education and health imparted by public sector institutions.

SOCIAL SECTOR ISSUES AND PROSPECTS

Within a historical perspective, rate of economic growth in Pakistan has been impressive, despite there being some periods of tardy performance due to political instability, wars, division of the country, unfavorable weather conditions and natural disasters. Economic growth was brought about by industrial and agricultural productivity enhancement, investment in urban areas, remittances from expatriates, and grants from foreign governments.

However, structural flaws in the economy have persisted such as gap between domestic revenues and current expenditure leading to excessive dependence on external capital flows. There has been inadequate mobilization of domestic savings. Efforts to increase tax revenues from direct taxes and boost the export sector have not yielded desirable results. Pakistan's economic, social and environmental woes are driven by the fundamental issue of poor management of physical and human resources. Sustainability thinking may be the only way out of this quagmire.

IV. LITERATURE REVIEW

SUSTAINABILITY: A NEBULOUS CONCEPTION

Development that meets the needs of the present without compromising the abilities of future generations to meet their own needs' (WCED 1987). This is the generally accepted and long standing definition of sustainability [Synonymous with 'Sustainable Development'] presented by the Brundland Commission almost 30 years ago. Since the publication of this report and initiation of public discourse on the subject, the concept of sustainable development has become a multidimensional policy target and has been posited as an action-oriented, ethical rule for decision-makers the world over. Also referred to as 'The Triple Bottom-line', sustainability is the reconciliation of 'three pillars': economy, ecology and equity (Jordan, 2008). Despite the cynicism of many scholars for whom the concept is vague and rhetorical (Bawden, 1997; Fortune & Hughes, 1997) and the criticism that the concept draws away attention from political decision making needed to enforce legislation in real conflict areas, as well as disappointments in public discourse regarding meager outcome of sustainability strategies despite three decades of discussion, most authors agree that sustainability has essential implications for the governance of societies in the twenty first century (Hugé et al. 2013; Voß & Kemp, 2015). The adoption by world leaders in September 2015 of the '2030 Agenda for Sustainable Development' with its set of Sustainable Development Goals (SDGs), indicates the current relevance of sustainability approach in spite of apparent boredom of some quarters of the academic community with this concept.

Notwithstanding its significance and popularity, sustainability may seem to be a bewildering concept given its numerous, contested and everchanging interpretations. However, as the modern world is becoming ever more diverse and complex, flexibility of interpretation can also be seen as a great strength of the sustainability approach. A single interpretation which attempts to be applicable across diverse contexts would be both impractical and dangerous (Bell & Morse, 2008). 'Constructive Ambiguity' is a redeeming characteristic of sustainability as it helps to gather many stakeholders in the society behind the same broad goals. Yet, while being a precondition for wide adoption and identification, ambiguity carries a risk of terminological abuse. For example, if sustainability is advocated as a blueprint or predefined end state from which to draw specific or short term governance prescriptions, such a conception would be a vague label which diffuses concrete challenges and reproduces the organizational arrangements which sideline social and environmental concerns. Therefore, sustainability must be recognized by its 'nebulousness' which is a feature commonly found in emerging paradigms (Robinson 2004).

TABLE 2

Distinguishing characteristics of Sustainability Paradigm

Description	Rationalist Paradigm	Sustainability Paradigm	
Philosophy	Maximization of productivity and utility for economic growth	Modulation of economic, social and ecological components of development	
Functionality	Programming and Control	Balancing and Networking	
Focus	Policy Making	Problem Handling	
Goals	Reaching Predefined ends	Nudging evolutionary processes	
Structure	Technical/ Mechanistic	Contextual/ Fluid	
Strategy	Precise targeting, concentrated action, reduction of uncertainty	Changing political force fields, steering iterative and participatory coordination among heterogeneous actors.	
Problem treatment	Cause and effect / linear models yielding piecemeal solutions	Redefinition of problem for interconnected, future oriented action	
Implementation Mechanism	Good Governance, Firm Competitiveness	Reflexive Governance, Corporate Social Responsibility	

FEATURES OF SUSTAINABILITY PARADIGM

As an emerging development paradigm, sustainability offers unique understanding and change in perspective for achieving lasting economic and human progress. As compared to the rationalist political and administrative paradigm with its focus on planning and control, sustainability offers an integrative and systemic approach to problem solving. Differences between these two worldviews are identified in Table 2.

STRONG SUSTAINABILITY VERSUS WEAK SUSTAINABILITY

Two typologies of sustainability based on level of intensity are often discussed in literature namely: Strong sustainability versus Weak sustainability (Rozema et al. 2012). Strong sustainability is focused primarily on ecological concerns. Emphasizing the existence of critical, non-substitutable natural resources and maximum carrying capacity of an ecosystem, strong sustainability calls for protection of natural environment as a priority.



Schematic Representations of Weak and Strong Sustainability (Cheng & Hu, 2010)



Strong sustainability argument implies that the environment is vital for human survival. Environmental degradation maybe irreversible and it will have negative repercussions for the economy and the society; therefore, ecosystem quality must be maintained or improved irrespective of economic cost.

On the other hand, weak sustainability is a consensual approach, suggesting 'the pragmatic integration of development and environmental goals' (Hugé et al. 2013). The interests and views of various stakeholders,

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as well as different temporal and spatial dimensions are brought under this overarching conception. For some authors, weak sustainability is a type of economic sustainability where the focus is on allocation of financial and human resources and levels of consumption. It is assumed that environmental quality can be valued in monetary terms and can be traded against socio-economic gain (Bell & Morse, 2008; Liu, 2009). Environmental concerns are not seen as being in conflict with socioeconomic modernization.

Of these two typologies, the weak sustainability form is the one that has gained more currency (Bell & Morse, 2008; Hugé et al. 2013). The proponents point out that increased levels of national income lead to higher levels of environmental protection, supporting their argument on the basis of the iconic Environmental Kuznets Curve (EKC)

GOVERNANCE INFUSED WITH SUSTAINABILITY: REFLEXIVE GOVERNANCE

The pragmatic aspect of putting sustainability into practice brings the issue of governance to center stage. In the last three decades since the world started experimenting with this notion, it is more or less established that sustainability is not automatic or preordained but needs to be carefully communicated and managed through governance structures. It is learnt that governing processes are embedded in cultural and political systems and governance arrangements at local, regional and global levels interrelate and interpenetrate with one another (Jordan, 2008).

The concept of governance has traditionally been related to the role of the sovereign state in administering political, economic and social processes and institutions to attain the goal of national progress. For example, the 'Governance and Development' report of the World Bank (1992) stated that "(Governance is...) epitomized by predictable, open and enlightened policy making; a bureaucracy imbued with a professional ethos; an executive arm of government accountable for its actions; and a strong civil society participating in public affairs; and all behaving under the rule of law." In recent years though, bureaucratic modes of governance have become unpopular and forms of governance are evolving which include a broader assortment of public, private, and non-profit organizations than would conventionally have been included within a purely `governmental' framework of governance. The mode of governance has a deep impact on framing and implementation of sustainability reforms and policies. Different modes of governance include:

- 1. Hierarchy (centralized/regulatory/ governmental)
- 2. Market (competitive/ corporate)
- 3. Networks (collaborative/ participatory/adaptive).

Currently, all three modes co-exist and dominate in different contexts. So, while the hierarchical form may have weakened in the sense that governments directly deliver fewer public services than before, state capacity of surveillance and facilitation of other actors, remains a critical factor for implementation of reforms. Market form of governance offering the advantage of efficiency and economic viability can solve sustainable development challenges through innovative technologies. Finally, network-based modes are currently preferred form of governing in which a network of participating actors is expected to determine how to steer society with minimum intervention from outside the network. When adopting the principles of openness, coherence, efficiency, and proportionality, network-based governance offers workable, indigenous solutions to sustainability problems (Hendriks & Grin, 2007).

Network-based governance being the hot topic of today has been given many other titles in literature such as participatory governance, transition governance, adaptive governance, meta governance and reflective governance. A popular term for governance infused with sustainability consciousness is 'Reflexive Governance' (Voß & Kemp, 2015). This is a style of steering which encourages network members to scrutinize and reconstruct the underlying assumptions, institutional arrangements and practices to address 'recursive problems of modernity'(Hendriks & Grin, 2007).

Reflexive governance is typically conceptualized as a self-critical, creative and interactive process which mobilizes the knowledge and resources of diverse societal actors. It includes appreciation of state-led activity of facilitating socio-technological transitions and modes of network co-ordination to support system innovation. Other characteristics of reflexive governance include: acknowledging 'ambiguous and contested nature of sustainability'; knowing that perspectives and solutions

are conditional and context specific; accepting that negotiation is required to build legitimacy, rather than being gained through 'authority' or 'neutrality': recognition that interventions may clash with established interests generating power struggles; and that outcomes of sustainable development depend on wider political discourse (Meadowcroft & Steurer, 2013).

Reflexive governance can enable stakeholders to tackle the so called 'Wicked Problems'. Sustainability problems are often referred to as 'wicked' because they are not easy to define, they can be very controversial, they change over time and various stakeholders conceive their nature, causes and solutions differently. 'Wicked Problems' require comprehensive solutions modified according to ground realities. Solution to wicked problems also involves behavioral change on part of citizen groups in that they would have to take ownership of the reform process. This amounts to discontinuing routines that are irrelevant to the problem, developing, adapting and reviewing new actions in a search for more durable social-ecological relations (Kenny, 2012). Such a solution is offered by Andrews et al. (2015) which they call the Problem-Driven Iterative Adaptation (PDIA) framework. The four core principles of the PDIA framework are as follows:

- 1. Local solutions for local problems
- 2. Decision-making that encourages 'positive deviance'
- 3. Embedding experimentation in a feedback loops for experiential learning and real-time adaptation
- 4. Engaging sector champions to ensure that reforms are viable, legitimate, relevant

CORPORATE SOCIAL RESPONSIBILITY: MAINSTREAMING SUSTAINABILITY IN MANAGEMENT

Sustainability concerns are important at both the macro level of society as a whole, as well as the micro level of the firm. At this level, measures of (weak) sustainability consider the speed at which resources are consumed by the company compared to how soon these resources can be regenerated. Corporate sustainability has several other titles such as 'Triple-bottom-line (TBL)', green/sustainable/ethical management practices, and the popular term 'Corporate Social Responsibility (CSR)'. The voluntary conflation of the 3 Es of sustainability: ecology, economy, 'beyond legal compliance' is the distinguishing feature of CSR (Carroll, 1999). Due to its focus on strategic philanthropy, innovation, environmental stewardship and social accountability, CSR has become embedded in management policy. This is despite the fact that evidence for 'Business Case' of CSR is ambivalent (MIT, 2011). While it has become very fashionable for to express concern about CSR, in reality economic bottom line still dominates corporate decision-making (Steger et al., 2007). Therefore, strengthening of 'Business Case' for CSR based on expansion of stakeholder spheres and eco-innovation remains critical for adoption of CSR principles in strategic business operations.

According to Aras & Crowther (2008), Corporate Sustainability has four inter-related equally important dimensions, namely:

- 1. Societal influence, (social contract and stakeholder influence)
- 2. Environmental impact (geophysical effect of production)
- 3. Organizational culture (relationship between the firm and its internal stakeholders)
- 4. Finance (an adequate profit as a return for undertaking risk).



Figure 2 represents these four aspects along the two polarities of organizational performance i.e. internal versus external focus and short term versus long term focus. It shows that sustainable companies recognize

FIGURE 2

Model of Corporate Sustainability (Aras & Crowther, 2008)

the exigencies of the local and global environment, taking into account present and future needs of a broad array of stakeholders.

Smith & Sharicz (2011) present seven elements deemed critical for satisfactory implementation of the broad CSR concept. These include:

- 1. Corporate governance
- 2. Leaders espousing sustainability agenda
- 3. Business plan for corporate sustainability
- 4. Organizational sustainability learning
- 5. Organizational culture for nurturing sustainability
- 6. Sustainability supporting information systems (IS)
- 7. Measurement and Reporting on triple bottom line performance

V. COMPARATIVE ANALYSIS

NATIONAL SUSTAINABLE DEVELOPMENT STRATEGY (NSDS) 2012: A TYPICAL POLICY STATEMENT OFFERING FEW DELIVERABLES

In a joint publication of UNDP and Government of Pakistan, the NSDS is presented as the 'Pathway to a sustainable & resilient future' of the country. The 67-page document outlining the NSDS, addresses every aspect of sustainable development from theoretical insights on the subject to current scenario in different areas of sustainable development along with specific strategic solutions to the problems identified. The sheer volume of the information provided would be useful to a scholar investigating the landscape of development activities in Pakistan in terms of the 'weak sustainability' argument, except that as is duly acknowledged, the report is largely based on work already done on the subject by SDPI (Sustainable Development Policy Institute).

The report opens with an inspiring vision statement: ' to evolve a just and harmonious society in the country through promotion of a vibrant and equitable economic growth without overexploitation of natural resources with fair distribution of development dividends to all; in particular to the marginalized, poor and vulnerable in the society and to future generations'. Presented as the state's commitment to further the sustainability cause, such assertions nevertheless seem rhetorical given that similar visions in the past have not amounted to much. The strategy goes on to dedicate separate chapters to Inclusive Economic Growth, Social & Human Development, and Environmentally Sustainable Development, The Emerging issue of Climate Change and Sustainable Development and Implementation Mechanism. Each chapter has seven to eight sections in which priority areas are discussed in specific detail. In each section, first the context is established, followed by issues and trends and finally seven to eight strategy recommendations and intentions are stated. So overall, the NSDS provides more than 120 strategies to achieve the stated vision. From a theoretical standpoint the strategy deliberates on every relevant theme of sustainable development. However, on a practical level the strategy has hardly any deliverables. The implementation mechanism proposed in the strategy did not materialized as per the timelines provided. At least no news reports to the constitution of 'National/Provincial/Local Sustainable Development Councils ' or Performance Reviews were available online till the presentation of this paper, 4 years after the date of publication of the NSDS. This reflects poor media engagement and reporting inconsistencies. Also there is a lack of credible data which could have helped in mid-term course correction.

The precursor of the NSDS, the National Conservation Strategy (NCS) presented twenty years earlier had presented many similar policies. Mid-term review of NCS in year 2000 revealed that awareness raising and institution building along with strengthening civil society influence on environmental issues were the primary achievements of NCS more so than improvements to the environment and natural resources. It was suggested that to improve outcomes:

- Strategy should be given adopted by the government, the key partners and stakeholders in letter and spirit.
- Instead of top-down and supply driven approach, follow bottom-up and demand-driven strategy.
- Establish a strong and responsive administrative structure.
- Improve monitoring and evaluation of the NCS by developing and operating an effective feedback mechanism.
- Enlarge the scope of financial outlays for meeting objectives of the strategy, including innovative sources of investment and funding.

Further the review suggested NCS-2 to serve as Pakistan's sustainable development strategy. So in fact a completely new NSDS was not

recommended. At the very least the NSDS should have incorporated the lessons learnt from the experience of NCS if it was to be more than just another policy statement. In the case of NSDS, as in cases of similar policy prescriptions, it is difficult to ignore lack of co-ordination among donors and an absence of accountability mechanisms for their interventions. Finally, the lack of political will to deliver on the proposals of NSDS seems to be the greatest hurdle in its execution.

NATIONAL FINANCIAL INCLUSION STRATEGY (NFIS) 2015: AN EMERGING SOLUTION SHOWING PROMISING RESULTS

Launched in May 2015 at an impressive ceremony which included Governor and Deputy Governor State Bank of Pakistan (SBP), Finance Minister of Pakistan, Country director World Bank and Head of the UK's Department for International Development in Pakistan, the NIFS is an initiative drawing ownership and commitment from senior leadership of the country. The NFIS has a clear goal of 'financial access to 50 percent of the adult population by 2020' with a three pronged approach including, setting up of a facilitating legal & regulatory framework; implementation of policy proposals to enhance credit, credible information and sound infrastructure on sustainable basis; and building partnerships and alliances for capacity enhancement and advocacy of Financial Inclusion agenda. There are eight focus areas namely: Digital Financial Services & Payment Systems; Microfinance; Agricultural finance; Housing finance; SME finance; Islamic finance; Financial Literacy and Consumer Protection; Insurance and Pensions. Within each area the NFIS looks at the specific challenges and defines operational tactics to be undertaken. There is also a 'Frame of Action' which puts all the actions required to meet the NFIS goal within one framework.

The real value of the NFIS lies in the functional capacity of its 'Coordination Structure'. Based on credible data generated through a nationally representative demand side survey (Access to Finance Survey - A2FS), review of progress has been undertaken by the NFIS Council (under chairpersonship of Minister Finance) which has had two formal meetings within the span of a year. Implementation of the NFIS is being

undertaken by Steering Committee (under chairpersonship of Governor State Bank) and various Technical Committees in NFIS focus areas are working diligently on achieving their specific targets. High-Level Followup Dialogue of NIFS under auspices of development agencies at international forum has also taken place. More importantly, report of this dialogue is readily available online, enabling scholarship, advocacy and media engagement.

Connected to the Sustainable Development Goals (SDGs) framework, NFIS entails a desire to empower financial consumers and restore their 'Right to Dignity and Fairness'. It focuses on marginalized sections of the society like low-income households (small farmers), women and small and micro enterprises. Important outcomes are already being reported such as doubling of access to formal financial services overall and tripling of women's access since 2008 (A2FS, 2015). The truly remarkable outcome however has been in terms of ' Branchless Banking' or 'Mobile Banking/ Financial Services (MFS)". Pakistan is considered as one of the fastest growing markets for branchless banking in the world. By using mobile phones and engaging small shop owners, this innovative technological system has helped catalyze a business model for low-income households, even in the most remote areas of the country.

The NIFS can be considered as an enabling device for Reflexive Governance. Nevertheless, it cannot be considered as a Sustainability Strategy as it completely misses the environmental component. And it is not even being suggested that the NIFS should include an environmental component. Example of the NSDS proves that an overdose of objectives can render a strategy practically useless. What is being advised here is that the 'Coordination Structure' of the NIFS becomes more environmentally informed and recognizes that social responsibility is incomplete without environmental responsibility. The next initiative being presented in this paper is helping to build such sustainability consciousness.

PAKISTAN INSTITUTE OF CORPORATE GOVERNANCE (PIGC): RAISING AWARENESS, BUILDING CAPACITIES

PICG is a not-for-profit company and public-private partnership established since 2004 for training and education on corporate governance.

In addition to the Securities and Exchange Commission of Pakistan (SECP), it is championed by SBP, the three stock exchanges in Pakistan, banking and insurance associations, apex bodies of the corporate businesses and Non-Bank Financial Institutions (NBFIs) as well as the leading business educational institutions. The stated objectives of PICG are:

- To promote awareness of corporate governance and encourage professional interaction among members and stakeholders.
- To enhance accountability of management to stakeholders including employees, customers, suppliers.
- To strengthen compliance by companies to laws and regulations, and promoting self-regulating practices.
- To organize events and publish reports to circulate information and data pertaining to corporate governance and maintain a library to encourage research.
- To strengthen performances of the Institute and enhance the global competitiveness of local companies

To achieve these objectives PICG is offering several specialized services at nominal cost. For example:

Director Placement Services: To facilitate companies with their search of accredited directors thereby helping in appointment of Independent Non-Executive directors. *Executive Education*: To develop sensitization and behavior for responsible sustainable business. *Corporate Governance training skills*: Director training program. *Company Exclusive Director Training. Bank Governance*: Director Orientation Workshop. *View from the board-room*: Breakfast networking session for sharing board room experience. *Research publications:* Policy guidelines and surveys. *Advisory Services:* On best corporate governance practices, with practical recommendations and implementation monitoring. *Global Network of Director Institutes (GNDI)*: To open opportunities for learning and sharing of experiences with international colleagues. *Events:* Conducting conferences and seminars for advocacy and skill building. For example, 'Conference on Sustainability Reporting, Corporate Social Responsibility and Governance (January 22, 2013) ' sponsored by Lucky Cement and JS

Bank and co-sponsored by Attock Refinery Limited and Lotte Pakistan PTA Limited.

These services of the PICG can become the game changers in sustainability efforts. Considering the seven elements critical for CSR implementation, only reporting on TBL performance is not addressed. Besides broadening the membership base, there are ample opportunities to create more alliances between PICG and its current members. For example, some media houses on the membership list can further promote this organization's work. Networking with other government agencies can be done in future. A hurdle being the bureaucratic nature of government in which collaborations are generally avoided. Nevertheless, if initiatives like NFIS and PICG can somehow be linked, that would be an example of reflexive governance.

VI. RECOMMENDATIONS

Development planners and managers of public and private organizations having the intent towards practical uptake and mainstreaming of sustainability approach must realize that real solution of Pakistan's development problems will be 'homegrown'. Hussain (1988) had suggested some solutions which still remain relevant today. Moreover, these solutions fit in well with the Problem-Driven Iterative Adaptation (PDIA) framework as shown below:

• Solving Local Problems with Indigenous Solutions

- Instead of importing expensive, capital intensive technologies, indigenous technologies should be developed which are more suited to local resource availability
- To fill the energy gap, smaller hydroelectric dams for example in the upper reaches of the Indus between Terbela and Skurdu would have to be constructed.
- Transport, communications and construction infrastructure networks linking small towns and far off communities.
- Decision-making that includes diversity of thinking
 - Decentralization of planning and monitoring from the federal and provincial level to district, village and mohallah level.
 - Inter-ministerial policy planning mechanisms, for ensuring preservation of the fragile natural environment in Pakistan

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- Development of professional proficiency and expertise as well as public awareness on environmental issues
- Experimentation, experiential learning and real-time adaptation
 - Acceleration in the advancement of small towns and associated small scale industrial clusters for rapid exchange of skill and know-how.
 - Technical training institutes providing qualified workforce which can invent and improve new equipment and machinery.
 - Financial incentives for establishing technologically selfreliant industries
- Viability, legitimacy and relevancy of reforms to be ensured by Sector Champions
 - Industrial and Agricultural Catalyst responsible for monitoring the progress of projects at the community level as well as specifying and overcoming project bottlenecks by bringing in support from local professional teams.

In order to harness the dynamism of Pakistan's private sector for fostering sustainability, Akhtar (2014) has suggested the following measures. It may be noted that these are in line with the modern conception of sustainability paradigm, reflexive governance and responsible management:

- Pakistani companies should link with the value chains in the region that have emerged as main drivers of growth in economies of East Asia.
- 80% of the workforce in Pakistan remains stuck in informal sector employment, with little or no social protection and social benefits. Sustainable development is possible only if the private sector can be positioned to promote inclusive growth and contributed towards job creation in the formal sector.
- Business Enterprises must play their part in increasing domestic revenues thereby helping in finance of critical public goods and services, and creating a virtuous circle.
- Attract investment in inclusive businesses and critical industries having potential for job creation and added value through the application of innovative processes and skills.

- Encourage a new stream of confident and innovative young entrepreneurs for developing innovative start-ups in areas such as the environment, education, health and skills. 'Social Entrepreneurs' can greatly benefit from the contribution of private resources, including traditional philanthropy; social venture funding; hybrid or 'blended-value' financing mechanisms; employee volunteerism.
- The private sector needs to espouse a longer time perspective in its investment criteria and try to make more effective investments in its production and marketing techniques.
- Private investments in sustainable energy projects for energy efficiency, more energy access, and cleaner energy sources will be critical for supporting the sustainability agenda.
- Businesses should lead in exploiting the potential of recycling and waste management that could lead to the creation of entirely new industries.
- Companies need to look beyond business-as-usual thinking and move towards creative use of technologies to generate wealth.

Smart urban centers should be setup through public private partnerships (PPPs) for low carbon industrial development and environmentally conscious pathways for urbanization in Pakistan

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ECONOMIC GROWTH IN CONTEXT OF INSTITUTIONS AND FISCAL POLICY

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Abstract. The aim of present study is to investigate the relationship between economic growth, institutional quality and fiscal policy over the period of 1984-2015, in the case of Pakistan. The unit root analysis reveals that all variables are non-stationary at level, but some are at first difference. The ARDL bounds testing approach to integration is employed to determine the long and short run relationship among the variables. Principal Component Analysis (PCA) is carried out to construct an index for institutional quality. It was found that institutional quality and government spending were positively affecting the economic growth of the country, while educational attainment and private investment were also significantly contributing to enhance the economic growth of Pakistan. It was suggested that government needs to improve the institutional quality and growth oriented spending to further boost the economic growth.

Keywords: Institutions, Economic Growth, Fiscal Policy, ARDL, PCA

JEL classification: C32; H260; Q43

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I. INTRODUCTION

Economic growth is raise in an economy's potential GDP and must be sustained for a developing economy. Economic growth is a fundamental instrument and indicator for sustainability and development of any economy. In long run, the focus of governments is to foster sustainable economic growth. The sustained growth of any country is helpful to improve the living standard of people in many ways like reducing the poverty, enhancing the infrastructure and educational facilities, combating increased inflation, and reducing the external vulnerabilities.

It may be observed that no society reaped towering echelon of economic growth without the intervention of government. Economies without interference of government face diverse hue of chaos that freezes their economic growth with passage of time. There is contentious debate regarding the role of government spending. Government expenditures allow government to reallocation of resources from elite to poor. The effectiveness of fiscal policy on economic activities has been on applied and theoretical research agenda for both policy makers and academicians since the emergence of macroeconomics. It is obvious that fiscal policy is a pre-condition to achieve macroeconomic permanence and sustainable economic growth that can have foremost impacts on income generation and poverty alleviation through taxation, optimal revenues generation, public borrowings and public expenditures. However, conversely; a bungling fiscal policy curbs the options for government for optimal tax collection, sustainable economic growth and economic performance.

Recently, role of public spending got a striking attention of the policy makers and researchers of the subject, especially after financial crisis of 2007. Endogenous and Keynesian growth theories proved the significant role of fiscal policy for economic development of an economy. The public spending may be helpful to raise the economic growth by developing the institutions like maintaining the law and order, protection of property rights, control over corruption, provision of public goods, and other social services that may lead to improve the aggregate demand and sustainability of economic growth.

The institutional role in growth route of economies got importance in decade of 1990, when two pioneer studies by Knack and Keefer's (1995) "Institutions and Economic Performance", and Mauro's (1995)

"Corruption and Growth" were published. By relying on new dimensions of property rights and institutions, these items ushered in a new generation of devoted research to prove importance of institutional framework in economic performance across the countries. Knack and Keefer (1995) considered the data of 97 economies from 1974 to 1989 and concluded that institutional quality is working as a protection of property rights and contract enforcement is an essential difference for investment and growth. In the same way, Mauro (1995) found that the corruption rates have negative association with economic growth and private investment. The other experimental evidence supports these preliminary results. For example, Alesina (1998) indicates that institutional quality plays a vital role for growth and this quality of institutions was measured by bureaucracy, corruption, property rights and law & order. As concerned for these results, it seems that literature provide pragmatic assistance to views of Douglass C North and Olson, who emphasized upon importance of contract enforcement and property rights in defining the prosperity and growth of economies.

According to new institutional economics, institutions play a pivotal role in determining the fate of the country. Unlike the neo-classical theories, it does not take institutions as given. The reason is claimed as that some countries may develop because of the institutional framework that enhances agents' efficient behavior, while others are facing problems because their institutional framework does not put off abusive behavior and methods that are ineffective, so there is frustration in investment and economic agents have hesitation to make contracts or agreements. "This negates some of the benefits of specialization, because agents are more vulnerable to others as they need to buy and sell products constantly" (North, 1990).

We consider that the two backward economies are very identical in human, technical and physical conditions and both are intended to acquire a plan to improve the economic performance. After adopting the recipes of neo classical theories, we would know about the main disadvantages of these economies, we applied the same models and there was expectation of similar outcomes in both economies. But results will not be to those as there were expectations in both countries where same models were implemented and similar countries meet the different fate as observed experimentally having very divergent paths of the countries that have applied the same types of policy. Why this is a difficult question to answer. But we know that in addition to all issues that involve concentrating on a particular idea and direct support to a certain point; we should keep in view the conditions of existing institutions in these economies.

Pakistan is a developing country of the world depending on agriculture, industry, manufacturing and remittances. The trend in economic growth of Pakistan is presented in the following figure. The growth rates of Pakistan remained relatively higher and impressive in the decades of 1960's and 1980's. The next decade of 1990's remained worst, not due to poor economic performance but also due to poor governance, political instability (during the period of 1988-99, eleven governments were changed resulting loss of confidence of investors and growth), debt burden (accrued during the period of 1977-88, resulting in annual interest payments made equal to 60 percent of budget and 25 percent for defense, so development expenditures were reduced significantly), and imposed sanctions on Pakistan in the decade of 1990's relevant to nuclear propagation.

The last year of 90's decade (1998-99) was most difficult year in history of the country due to many significant domestic and regional events. These included the nuclear tests of Pakistan and India, later on dismissal of the voted political government in October that same year. In fact, the decade of 1990's, as a whole, was the decade of under development, as compared with previous decades. The nuclear tests caused to impose large variety of sanction on Pakistan by developed countries.

During the constitutional period of five years (2008-13) of Pakistan People Party, the fragile economy of Pakistan remained floundering, as the economic managers ineffectively made efforts to bridge the widening budget deficit year-after-year. Moreover, public debt was increased to a record level and other macro-economic indicators were on lowest ebb. The average GDP growth rate during this period was only three percent, industrial growth was near to zero, investment rate declined to 12.5% of GDP (lowest in the history of Pakistan), budget deficit was 7% of GDP on average and public debt became double. Corruption and poor governance were key factors that affected every sector of the economy.

The number of people living below the poverty line increased to 40 percent from 30% as compared with previous five years.

The fluctuating economic growth of Pakistan needs to be explored further. Realizing the importance and effectiveness of institutions and government spending from literature, it will be much concern of interest to know the impact of public spending and institutions on economic growth of Pakistan. This study is intended to determine the impact of fiscal policy and institutions simultaneously on economic growth of Pakistan which is a novel contribution in literature of economic growth. There is hardly any study investigated the effect of institutions and fiscal policy jointly on economic growth of the country.

After introduction, section 2 outlines the literature review and section 3 provides theoretical framework. Section 4 has details of data and variables. Methodology and empirical analysis are discussed in section 5 while section 6 concludes the chapter

II. LITERATURE REVIEW

Christie (2011) highlighted various aspects of the relationship between government expenditures and economic growth in long term. A model has been developed through the application of a general method of moments (GMM) to find the dynamic nature of relation between the described variables for 136 developing and developed countries during the period of 1971 to 2005. The conclusions of the study indicate that government spending beyond the threshold level affects the growth negatively. The findings of the study indicate that public spending at 26-32% of GDP is threshold level for developed economies and 33% of GDP for developing countries. Based on the findings, it was suggested to manage public spending; because 28 developed economies have the public spending more than 30% of GDP from 2001 to 2005. The expansion of public spending in these economies will have negative impacts on long term growth. The outcomes of research indicate that improving the quality of institutions may improve the economic growth in case of increasing public spending. It was also found that the threshold level of spending without imposing serious side effects between production and non-productive spending, which alleviate the potential gain of increased government expenditure.

Babalola and Aminu (2011) investigated the relationship between fiscal policy and economic growth in Nigeria over the period covering 1977-2009. Engle-Granger approach and Error Correction Model are applied to test the long and short run relationship among variables. GDP growth rate is taken as dependent variable while productive government expenditure, unproductive government expenditure, direct income tax and capital expenditure are considered as independent variables. The results show that both productive and unproductive expenditures have insignificant impact on economic growth. On the other side, contrary to economic theory, direct income tax has positive effect while capital expenditure has negative impact on economic growth of Nigeria. Improvement in government expenditure on health, education and economic services is recommended to boost economic growth.

Kakar (2011) determined the impact of fiscal variables on economic growth in Pakistan covering the period from 1980-2009. Johansen Cointegration, error correction and Granger causality techniques are applied to determine the relationship among the variables. In this study, GDP growth rate is considered as dependent variable while tax revenues, real interest rate, public expenditure, consumer price index, capital stock and population growth rate are taken as independent variable. The findings show that fiscal policy affects the economic growth in long run. In short run, economic development can be stimulated by controlling interest rate and government expenditure at the cost of inflation.

Benos (2009) disintegrated public revenues and government spending into subcategories and analyzed the impact of each category on GDP growth of 14 European Union economies for the period 1990 to 2006. In this study, public spending on health, recreation, education, housing, culture, economic affairs, religion, defense, public order safety, taxes on wealth, income, capital, imports, production, and fiscal deficit are considered as fiscal variables while private investment, population, secondary education, employment growth, imports and exports are treated as non fiscal variables. Panel data techniques and ordinary least square methods were applied to estimate the results. The empirical analysis reveals that public spending on human capital has not significant effect on economic growth while infrastructure spending affects the economic growth positively. It was also found that taxation affect economic growth negatively while budget deficit has not a clear relation with economic growth.

Kneller, et.el (1999) determined the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The obtained results show that there is a long-run relationship between government expenditure and economic growth. Furthermore, they also found a unidirectional causality from government expenditure to growth for 16 out of the 30 countries that support the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the Wagner's law. They also found the existence of feedback relationship between government expenditure and economic growth in four countries.

Glaeser (2004) observed that proposition about the positive impact of institutions on economic growth is ambiguous and variables used to measure the institutional quality is unsuitable for this purpose. He argued that these variables do not measure the quality of institutions which is claimed as constraints in theoretical literature but it is outcome of institutional variables. Author is of view that governance indicators are very volatile that do not reflect the actual position of political environment bit it varies with variation in per capita income. The established empirical relationship between institutions and economic growth in literature was questioned about the instrumental techniques and common measures by author and his collaborators. The study also raised some interesting analytical questions regarding the conceptualization of institutions, the uncritical use of institutions and governance as similar concepts and the nature of the theoretical link between governance, institutions and economic development.

Feng (2003) used the pattern of political economy theory of economic growth to investigate the economic development in Pacific Asian economies. The profound argument of the study is that institutions are very important to explain the economic growth of these countries. Yet, a closer look at his work unveils a more gradation situation. The author showed that variables such as political polarization, political stability and government repression were the political variables affecting growth in these countries. He also explored that political institutional framework is an important factor for explanation of economic growth by restricting individual decisions in their marketplace.

Hall and Jones (1999) postulated one of first empirical research establishing the relation between economic performance and institutions. Social infrastructure is considered as institutional variable which was defined as "the institutions and government policies that determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output." They mentioned the relation between the provision of protection to private productive units from confiscatory diversion and institutions. Yielding that a perfect measurement of social infrastructures is not in rehearsal, they choice a proxy gained by pooling two indexes: "an index of government antidiversion policies" and "an index of openness to international trade". On the other hand, a fundamental basis to measure the institutions was provided in this study and adopted methodology to measure institutional variables was used in many studies to know the relation between institutions and economic performance in many studies later on.

These studies reinforce the argument that empirical outcomes are likely to differ from country to country and time to time, even by using same techniques and methods. It can be viewed also from literature that there is hardly any study in our observation which may explore the impact of government spending on quality of institutions and effects of government spending along with institutions on economic growth of Pakistan. This study will provide a baseline for further exploration of components of fiscal policy and their effects on the economy of Pakistan.

III. THEORETICAL FRAMEWORK

In this section, a framework is derived to investigate the impact of fiscal policy and institutions on economic growth in an economy.

According to Madni (2014), "endogenous growth models explain the growth differences of economies in long run. Some models, among them, highlight the effectiveness of public spending and taxation rate on growth of a country. Barro (1990) derived a model showing the utility level of infinite households living in a closed economy and want to maximize the utility as follows;

$$U=\int_0^\infty u(c) e^{-pt} dt \tag{1}$$

Utility in above function is gained by consumption c of per person in the economy, and p>o is the constant rate of time preference. When population is assumed as constant then utility is;

$$u(c) = \frac{c^{1-\theta} - 1}{1-\theta}$$
(2)

Where $\theta > 0$, and negative value of $-\theta$ represents the constant marginal utility. Barro and Sala-i-Martin (1992) argued that households have real assets a(t) in the form of claims on internal loans or; physical or human capital. The real rate of return on assets, in units of future consumables per unit of current consumables per unit of time, is r(t). Thus, the household's budget constraint determines the change over time is assets to be

$$a = ra - c \tag{3}$$

The term ra includes returns on human and physical capital. The growth rate of consumption per person is obtained by first order condition for maximization of utility in equation (1) subject to the budget constraint in equation (3)

$$\frac{c^*}{c} = \left(\frac{1}{\theta}\right)_{(r-p)} \tag{4}$$

It is assumed constant returns of capital following Rebelo (1991), so that

$$y=Ak$$
 (5)

Where A>0 is the constant net marginal product of capital. This production function can be modified to distinguish the human and non human capital. The function can be extended also to those sectors that produce physical and human capital. Now substituting r=A into equation (4), we get

$$\frac{c^*}{f = c} = \left(\frac{1}{\theta}\right)_{(A-p)} \tag{6}$$

Where f shows per capita growth rate and A>p>A (1- θ)

Now the analysis is incorporated with public sector. It is assumed that g is the quantity of public services provided to each household

producer and these public services can be considered as an input to private production. Production now exhibits constant returns to scale in k and g together but diminishing returns in k separately. Now production function can be written as

$$y = \Phi(k, g) = \Phi(\overline{k})$$
 (7)

It is assumed here that production function is Cobb-Douglass, and then it can be written as

$$\frac{\underline{y}}{k} = \Phi\left(\frac{\underline{g}}{k}\right) = A\left(\frac{\underline{g}}{k}\right)^{\alpha}$$
(8)

After simplifying, we get

$$y = Ak1 - \alpha g \alpha \tag{9}$$

Where y is per capita output, A is a productivity factor and k is per capita private capital. If the government expenditures are financed by a flat rate income tax

$$g = T = ty = t. \ \Phi\left(\frac{g}{k}\right) \tag{10}$$

Where T is government revenue, t is the tax rate and g shows aggregate expenditure. But this equation has a constraint of balanced budget. In developing countries, it is hardly observed that government balances its budget so Kneller et al (1999) and Bleaney et al (2000) took a more practical view by assuming a non balancing government budget constraint in some periods. Now (10) can be re-write as,

$$n g + C + b = L + \tau n y$$
 (11)

Where b is the budget deficit/surplus in a given period. Both C and L are hypothesized to have zero effects on growth. The predicted sign of g and τ is positive and negative respectively. Similarly, b is zero as long as Ricardian equivalence holds, but may not be zero otherwise (Bleaney et al, 2000).

Theoretically, a proportional tax on output affects private investment but a lump sum tax does not. Subject to specified utility function, Barro (1990) and Barro and Sala-i-Martin (1992) derived the long run growth rate in this model as,

$$\gamma = \lambda (1-\tau) (1-\alpha) A 1 / (1-\alpha) (g/y) \alpha / 1-\alpha - \mu$$
(12)

Where λ and μ stand for parameters in the assumed utility function. This equation shows that growth rate is decreasing function of distortionary tax rate τ) and an increasing function of productive government expenditures (g).

Both fiscal (xit) and institutional variables (zit) in the spirit of Kneller et al (1999) are considered then growth equation becomes,

$$y_i = \propto + \sum_{i=1}^k \beta_i z_{it} + \sum_{j=1}^m \gamma_j x_{jt} + \epsilon_{it}$$
 (13)

If the budget constraint is fully specified, then

$$\sum_{j=1}^{m} x j t=0$$

So expenditures are equal to revenues. To avoid the perfect collinearity in the model, we have to omit at least one element of x (xm). Rewriting the equation (13), we get;

$$y_{it} = \infty + \sum_{i=1}^{k} \beta_i z_{it} + \sum_{j=1}^{m-1} \gamma_j x_{jt} + \gamma_m x_{mt} + \in_{it}$$
(14)

Following is general form to analyze the impact of fiscal policy and institutions on economic growth.

$$Y = \beta 0 + \beta 1 FPt + \beta 2 Zt + \mu$$
(15)

Where FP represents the fiscal policy variables and Z shows the institutional and control variables.

IV. DATA AND VARIABLES

In this section, a framework is derived to investigate the impact of fiscal policy and institutions on economic growth in an economy.

This study is focused to determine the impact of government spending and institutions simultaneously on economic growth of Pakistan. For this purpose, economic growth is treated as a dependent variable while institutions and government spending along with control variables are independent variables. The data set of institutional quality is based on the compilation of different institutional measures from ICRG (International Country Risk Guide), organized in twelve clusters namely as Bureaucratic Quality, Democratic Accountability, Ethnic Tension, Rule of Law, Religion in Politics, Military in Politics, Corruption, Government Stability, External Conflict, Internal Conflict, Investment Profile and Socioeconomic Condition. All of these variables range from 0-10. A higher score means higher condition and vice versa. By considering all these variables, an institutional quality index is developed by PCA (Principal Components Analysis). PCA is a statistical technique which uses an orthogonal transformation to alter a group of observations having a possible correlation of variables into an array of uncorrelated linear variables. The time span of data for this part is from 1984-2015.

Government expenditures are treated as a percentage of GDP to represent the fiscal variables. Economic growth is measured from real economic growth, education is primary and secondary enrolment as percentage of population, trade openness is ratio of sum of exports and imports while investment is considered as private investment as percentage of GDP.

V. METHODOLOGY AND EMPIRICAL ANALYSIS

To find the unit root and order of integration, ADF test is applied to all variables. The results indicate that some variables are stationary at level while others are stationary at first difference. The estimated results of the test are reported in the following table (1).

Variable	LEVEL		1 st DIFF	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
INST	-1.73	-1.84	-4.71*	-4.63*
GEXP	-1.69	-2.28	-7.97*	-7.85*
EDUC	-0.88	-4.24*	-5.66*	-5.55*
OPEN	-2.52***	-2.72***	-6.43*	-6.24*
INVT	-1.72	-2.53	-3.74*	-3.99*
GDPG	-2.63	-3.89	-5.67**	-5.98**

TABLE 1

Unit Root Tests Results (Augmented Dicky Fuller Test)

Note: *, ** and *** shows significance at 1%, 5% and 10% level respectively

If variables have different integrating order, then ARDL approach is appropriate to find the long and short run dynamics of variables.

Now, the unrestricted vector auto regressive model is applied to determine the lag length of variables via Schwartz Bayesian Criterion. The minimum value of Schwartz Bayesian Criterion represents the order of lag length as shown in the following table (2).

TABLE 2

VARIABLES **GDPG** GEXP INST EDUC INVT **OPEN** LAGS 0 1.55 2.97 3.26 0.56 0.54*1.83 0.07* 1.27* 1 1.39* 2.73 0.16* 1.93 2 0.33 2.45 1.92* 0.71 2.59 1.99

Lags Defined Through VAR-SBC

NOTE: * Shows minimum Schwarz SBC

To find the presence of long run relation between variables, the value of F-statistics is calculated. The calculated value of F-statistics is 5.34 while the critical Bounds values are at 10% level of significance (2.035-3.153), at 5% are (2.365-3.553) and at 1% are (3.027-4.296) so it indicates the presence of long term relation between variables.

ESTIMATION OF LONG RUN ELASTICITIES

After finding the existence of long run relationship, ARDL technique is applied to estimate the long run and short run coefficients. The ARDL form of the growth equation will be as follows;

 $\Delta GDPG = \alpha_0 + \sum_{i=0}^{n} \alpha_1 \Delta GDPG_{t-I} + \sum_{i=0}^{n} \alpha_2 \Delta GEXP_{t-i} + \sum_{i=0}^{n} \alpha_3 \Delta INST_{t-i}$ $i + \sum_{i=0}^{n} \alpha_4 \Delta EDUC_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta INVT_{t-i} + \sum_{i=0}^{n} \alpha_6 \Delta OPEN_{t-I} + \beta_1 GDPG_{t-1} + i = 0$ $\beta_2 GEXP_{t-1} + \beta_3 INST_{t-1} + \beta_4 EDUC_{t-1} + \beta_5 INVT_{t-1} + \beta_6 OPEN_{t-1} + \varepsilon_t$

In this model, government expenditures (GEXP), institutions (INST), education (EDUC), private investment (INVT), trade openness (OPEN) are considered as independent variables while GDP growth is a dependent variable. To test the efficiency of data, White heteroscedasticity test, serial correlation LM test, normality test and ARCH test were applied and output of tests indicate that data has not any econometric problem. The estimated results are pasted in the following table (3)

TABLE	3
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Dependent Variable GDP	ARDL Technique					
growth	Order(1,1,2,1,0,1)					
Regressors	Coefficients	Std. Error	t-Statistic	Prob.		
GEXP	0.27***	0.33	0.42	0.07		
INST	0.47*	0.51	0.43	0.01		
EDUC	0.65***	0.38	0.63	0.08		
INVT	0.37**	0.28	0.51	0.04		
OPEN	0.45	0.72	1.34	0.18		
$R^2 = 0.92$						
Adjusted R ² =0.88						
DW-stat =1.93						
Serial Correlation LM Test=0.08(0.77)						
ARCH Test =2.53(0.38)						
White Heteroscedasticity $=0.85(0.48)$						
Jarque-Bera Test $= 0.44(0.70)$						

Estimated Long Run Coefficients for Growth Equation

Note: *, **and *** shows significance at 1%, 5% and 10% level of significance respectively.

This study examined the relationship between economic growth, government spending and institutions. The estimated results indicate that government spending has significant impact on economic growth of country and 1 percent increase in government spending will lead to economic growth by 0.27 percent. The increased government spending causes to improve the human capital, infrastructure and more facilitation for public that leads to increase the productivity of labor so economic growth is accelerated. The estimated result point out that institutional quality is more important than the government spending. The effectiveness of institutions on economic growth of Pakistan is significant and one unit increase in institutional quality will lead to improve the economic growth by 0.47 units. It is evident that with strong and effective institutional framework, people have inclusion in the development process as well as availability of equal opportunities. The

efficient judicial and law enforcement mechanism makes it convenient to reduce the transaction costs so the gains from economic activities increase. Education also plays an important role to increase the growth of Pakistan. Findings of empirical investigation reveal that on unit increase in educational level of people will boost the economic growth by 0.65 units. It is evident that literate person is more productive as compared with illiterate persons. In the same way, private investment has a significant and positive impact on economic growth. It indicates that increase in investment increases the productivity and there are more chances of employment so it accelerates the economic growth. The derived results show that trade openness has not significant impact on economic growth. One of the reasons of insignificance of trade openness may be the non-competitive prices of our production sector in international market due to energy crisis and inflation rate of the country while on the other side; our imports are higher than exports so Pakistan is not much beneficiary from free trade policies.

ERROR CORRECTION REPRESENTATION FOR THE ARDL MODEL OF ECONOMIC GROWTH

After estimating the long run relationship, we are able to estimate the error correction model for short run dynamics. The ECM form of growth model is following;

	n	n	n	
$\Delta GDPG =$	$\alpha_0 + \sum \alpha_1 \Delta G$	$DPG_{t-I} + \sum \alpha_2 \Delta I^{*}$	$NST_{t-i}+ \sum \alpha_3 \Delta EDUC$	t-
	i = 0	i = 0	i = 0	
$\sum_{n=1}^{n} \alpha_n \Delta \mathbf{N}$	$VT \rightarrow \sum_{n=0}^{n}$	$ODEN \rightarrow \sum_{n} a_n A(n)$	$\mathbf{FVD} + \mathbf{FCM} + \mathbf{c}$	
$i + \sum \alpha_4 \Delta II $	$v_{1t-i} + \mathbf{Z} \alpha_{5} \Delta_{1}$	$OPEIN_{t-1} + \mathbf{Z} \alpha_{6} \Delta \mathbf{v}$	$JEAF_{t-i} + ECM_{t-i} + \varepsilon_t$	
l = 0	l = 0	l = 0		

Here ECM_{t-1} is the adjustment parameter. It shows the speed of adjustment while the other parameters represent the short run coefficients reported in the following table (4).

TABLE 4

Estimated Short Run Coefficients for Growth Equation

Dependent Variable	ARDL Technique				
GDP Growth	Order $(1,1,2,1,0,1)$				
Regressors	Coefficients	Std. Error	t-Statistic	Prob.	
ΔGEXP	0.27	0.31	0.42	0.09	
ΔINST	1.10*	0.19	1.26	0.38	
ΔEDUC	1.35	0.41	1.33	0.24	
ΔΙΝΥΤ	2.54	0.62	0.48	0.08	
ΔΟΡΕΝ	0.19	0.18	0.38	0.46	
ECM _{t-1}	-0.37**	-0.31	-1.22	0.05	
R ² =0.93					
Adjusted R ² =0.89					
DW-stat =1.92					
Serial Correlation LM Test=0.15(0.66)					
ARCH Test =0.34(0.48)					
White Heteroscedasticity $=0.16(0.38)$					
Jarque-Bera Test =0.87(0.54)					

Note: * and ** shows significance at 1% and 5% level of significance

The estimated lagged error correction term ECM_{t-1} is negative and significant. The negative and significant error correction term indicates that there is a long run relationship among the variables. The feedback coefficient is -0.37. It indicates that 37 percent disequilibrium is corrected in the short run. In short run, public spending and private investment is significant for economic growth while institutional framework, education and trade openness are not significant in the short run.

VI. CONCLUSION

Institutional development and government spending are necessary to promote the economic growth and living standard of the country, has been proven in this study. In this analysis a number of competing hypotheses, on what contributes to Pakistan's economic performance, have been tested using econometric model. Subsequently, the factors of economic growth were investigated. This study is a first attempt to explore the factors of economic growth in context of institutional quality and fiscal policy in Pakistan. There is hardly any study that investigated the mentioned variables simultaneously for the said country. This study used the time series data covering the time span from 1984-2015 and econometric techniques were applied to formulate the empirical results. The empirical findings come up with following results.

The estimated results suggest that the economic growth depends fundamentally on government expenditures. Government spending is contributing to improve the growth but it has very little share. There is an ample space to improve the productive efficiency of government spending to have major proportion in improvement of growth. The public spending establishes a relation of confidence between state and public. Higher the level of confidence builds higher quality of institutions. If government spending is not public oriented, the people prefer to be more corrupt and lose their confidence on institutions that leads to slow the growth of the country. To boost the economic growth of the country, government has to take steps to improve the efficiency of public spending as a major portion of public spending going to be preyed of corruption. According to report of transparency international, in the Corruption Perception Index (PCI), Pakistan stands at 117th position out of 168 countries where 1st position got the Denmark where corruption level is at lowest level while Somalia and North Korea remained at 167th position that reflects highest level of corruption in the world. The Corruption Perception Index (CPI) ranks countries and territories based on how corrupt their public sector is perceived to be. The public oriented and corruption free expenditures may increase the economic growth as well as institutional structure of the country.

Secondly, institutions play an important and significant role to explain the economic growth of the country. As the institutions are more efficient and, people have more trust on their governments and attraction for foreign investors but inefficient institutional structure degrades, overall, the economic system of the state. The institutional indicators of Pakistan are going towards better positions but there is still an ample space for their improvements to boost the economic growth of Pakistan.

Education is the backbone of a society for development. In Pakistan, education is significantly and positively affecting the economic growth. The literate people have more respect for the rules and regulations of the state. Government of Pakistan is trying hard to increase the level of education in the country but 100% literacy rate could not be gained up to now.

International openness has not a significant impact on economic growth of Pakistan. It may be due to many reasons. One of the reasons of insignificance of trade openness may be the non-competitive prices of our production sector in international market due to energy crisis and inflation rate of the country while on the other side; our imports are higher than exports so Pakistan is not much beneficiary from free trade policies.

By concluding, government spending fosters good institutions and high quality institutional framework is expected to be developed in equitable and open economies, with a sound fiscal contract in an educated population. If these conditions are met, then it is possible to attain remarkable and sustained economic growth. Overall, results propose that variables leading to explain the economic growth are in reach of government. Although it is not an easy task but there is room for policies aimed at improving the growth.

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CORRUPTION, DEMOCRACY AND ECONOMIC GROWTH: DOES CONDITIONALITY MATTER?

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Abstract. This paper gives insight about the role of democracy in two competing hypotheses whether corruption 'greases the wheels' or 'sands the wheels' of bureaucracy. The study also examined whether conditional cooperation between corruption and democracy matters or not in this regard. The empirical results indicate that democracy plays an essential role in determining the corruption-growth relationship, as the coefficient of interaction term between corruption and democracy is negative and significant. The results support the hypothesis that corruption greases the wheels of administration and thereby promotes growth in countries having poor democratic norm, and second hypothesis holds in case of higher degree of democracy. The results of the study suggest that promotion of democratic norms is very essential to curb the corruption level and to boost the economic performance of the nation. Because institutional development promotes the check and balance system in the country that enhances economic growth through increase in investment.

Keywords: Democracy, Corruption, Growth, Conditionality, Panel Data

JEL classification: C21, C23, D02, D72, D73

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I. INTRODUCTION

The corruption influences socioeconomic and political factors directly as well as indirectly through institutional framework of the country. It adversely affects the performance of public officials, deforms the public policies and thereby leads to misallocation of resources. It has weakened the process of world development by affecting the execution of law and order, and thereby undermined the justice in various countries. It denied victims from a fair and impartial trial and led to violation of basic human rights. It has not only corroded the communities' abilities required to tackle the issues of international crime and terrorism, but also hampered the pace of economic development. Therefore, it is the single greatest hindrance to socioeconomic development, and has given priority to anticorruption initiatives in its strategies for improving the quality of governance (World Bank, 1997). The estimates of World Bank (2004) indicate that US\$1 trillion is paid in bribes out of total US\$30 trillion of world income. African Union estimated the cost of corruption in Africa around US\$148 billion annually that is 25% of Africa's GDP (Elbahnasawy & Revier, 2012).

The performance of state institutions has significant role in country's socioeconomic development and thereby prevention of corruption within society. According to Blackburn, Bose, & Haque (2005), "bureaucrats, public officials, politicians and legislators hold unique positions that emerge discretionary power". Abuse of this power can cause and have long-lasting unpleasant effects on national socioeconomic structure and even in some cases government has to resign from its office. For example, collapse of Rajiv Gandhi's government in India, Chuan Leekpai's government in Thailand, Suharto and Abdur Rehman Wahid's governments in Indonesia, General Sani Abacha's administration in Nigeria and Pakistan Muslim League (N) and Pakistan People Party Governments in Pakistan.

Asia is the most corrupt region in the world, where 25 to 40 percent politicians and 15 to 33 percent public servants are corrupt (Jain, 2001). Almost all developing nations are on the lower edge of the corruption scale (as per Transparency International surveys) and paid a high cost of corruption. For example, Pakistan has lost more than Rs.8.5 trillion (US\$94 billion) in corruption, tax evasion and bad governance, and corruption level in Pakistan is increased by 400 percent (Transparency

International Pakistan, 2012). The corruption scenario in Nigeria is also not different from other developing countries. In Nigeria, estimated looted money due to widespread corruption and entrenched inefficiency is about 1.067 trillion naira (\$6.8 billion) and list of arrested dignitaries includes former minister of Works and Housing, Hassan Lawal; former speaker of the House of Representatives, Mr. Dimeji Bankole and Deputy Speaker Usman Nafada (Country Reports on Human Rights Practices, 2012). Indonesia has paid US\$238.6 million in the form of corruption in 20111. Besides, people and enterprises use about 1% and 5% of their income on illegal payment, respectively.

Dishonest behaviour of public official in the office is generally infectious and normally supported by the dishonest behaviour of other officials. Therefore, public sector corruption is considered the most harmful, persistent and difficult to fight. But, in spite of all these, socialscientists have evaluated the determinants and consequences of it, as society has to pay huge socioeconomic and ethical costs. The quantitative analysis of corruption has multiple implications. It not only solves the purpose of descriptive analysis, but it is also essential to understand the corruption mechanisms, and for the emergence of successful anticorruption strategies.

The corruption debate has focused on, whether it is deleterious or helpful to the economic activity. This implies that whether corruption acts as 'grease-the-wheals-of-bureaucracy' or 'sand-the-wheals-ofbureaucracy'. First stream of debate suggests that bribes raise the level of investment and economic growth, acting as a trouble saving device or speed money. Leys (1970) argued that small side payments to public office bearers could help in reducing the bureaucratic hindrances and thereby encourage economic activity. The empirical research on bureaucratic efficiency has mixed findings. For example, Acemoglu and Verdier (1998) rationalize some forms of corruption in the enforcement of property rights but Ades and Di Tella (1997) empirical results failed to support the hypothesis "corruption greases-the-wheels-of-bureaucracy" in case of petty corruption. Mauro (1995) identified another channel through which corruption impacts growth that is the selection of projects

¹Ezra Sihite (30 January 2012), "Corruption Costs Indonesia \$238m in 2011" Jakarta Globe.

carried out by the government. It documented that corruption significantly lowers investment in the economy even when allowance are paid to public officials. Knack and Keefer (1995) findings confirm the role of institutions that protect property rights because these are very essential to investment and hence growth.

Second stream of debate asserts that corruption can be fatal to economic activity because it not only makes bureaucratic procedures sluggish, expensive, inefficient but also diverts resources to unproductive activities (Mauro, 1998; Myrdal, 1968; Shleifer and Vishny, 1993; Tanzi and Davoodi, 1997). In addition, corruption hampered the pace of economic growth even more in countries having weaker institutions such as democracy, political stability and governance. The corruption also hurts the growth through resource misallocation when decisions about public funds investment and private investment are made by the public office bearers. This misallocation is basically the result of the corrupt official decision-maker criteria 'potential for bribery'. These office holders may compromise on human development through a worsening public health care and education programs (Reinikka and Svensson, 2005), and allocating public funds to certain areas (military spending) that have more capacity to generate illegal money as compared to their counterparts required to improve the living standards of national residents (Gupta, de Mello, & Sharan, 2001). In addition, corruption may escort to expensive concealment and detection of unlawful earnings, resulting in a deadweight loss of resources (Blackburn et al., 2006; Blackburn and Forgues-Puccio, 2010).

In a nutshell, the basis of both 'grease the wheels' and 'sand the wheel' hypotheses lies in the interaction between corruption and institutional features. The exiting literature on corruption-growth relationship indicates that the role of institutions was not properly investigated with a very few exceptions, and especially in the context of Developing Eight (D-8) countries. The cultural norms are basically founded on religion and all religion including Islam does not permit to misuse of government money or office for personal benefits. All D-8 nations are Muslim, nations that opted Western Democracy, and also facing the problem of corruption. Thus, it is very necessary to investigate the impact of corruption on growth in these countries considering the role of democracy. The focus of study in hand is to empirically investigate the

impact of corruption on economic growth by incorporating the institutional feature (democracy) in D-8 countries. Besides, study has also examined, which of the hypotheses "corruption greases the wheels" or "sands the wheels" holds?

The rest of the study is organized as follows. Section 2 provides the theoretical background and analytical framework. Section 3 deals with econometric model and estimation method. Section 4 gives detail of data description. Section 5 shows empirical findings and discussion. Section 6 is specified for conclusions and policy implications.

II. THEORETICAL BACKGROUND AND ANALYTICAL FRAMEWORK

Christie (2011) highlighted various aspects of the relationship between government expenditures and economic growth in long term.

Following Becker (1968), Polinsky and Shavell (1984) developed a model, in which individuals not only consider the expected gains but also compare these ones to the expected costs (in the form of the probability of detection and punishment). This implies that the net expected benefit must be positive for the incidence of corruption. Corruption-growth debate has two streams of arguments; corruption might promote or retard economic growth. Following Solow's (1956) growth accounting process, we used standard production function to investigate the corruption-growth mechanism as below.

$$Y_{it} = A_{it} [F(K]_{it}, L_{it}) \tag{1}$$

Where Yit is the total output, Ait is total factor productivity, Kit is the capital stock and Lit is the total labour in the country i at time period t. Total differentiation of function $[(Y]]_{it}$ gives the following:

$$dY_{it} = [[F(K]]_{it}, L_{it})dA_{it} + A_{it}(F_K dK + F_L dL)$$
(2)

Dividing equation (2) by Y_{it} we get the same decomposition as Solow (1957)2.

² However, we use the equation to examine the divergence of cross-country growth performance instead of studying the traditional growth accounting.

$$\frac{dY_{it}}{Y_{it}} = \frac{\mathbf{d}A_{it}}{A_{it}} + \frac{A_{it}(F_K \, dK)}{Y_{it}} + \frac{A_{it}(F_L \, dL)}{Y_{it}} \tag{3}$$

Following the interpretation of Schumpeter's theory of economic development (Schumpeter, 1912, 1939), equation (3) show two effect of changes that can influence an economy; (a) growth component that indicate the impacts of changes in factor availability, and are shown by the growth rates of capital and labour in the production function. (b) Development component which show the effects of socio-technological changes and other factors related to the total factor productivity growth (Schumpeter, 1912). Following Mo (2001) interpretation of this transformation, we can write equation (3) as follows:

$$GR = F(a_{it}, IY, GL) \tag{4}$$

Where GR indicates the growth rate of real output, a_{it} is the total factor productivity, IY shows the investment-output ratio, and GL is the growth rate of labour. Levine and Renelt (1992) identify the factors, which are robust in determining the economic growth such as share of investment in GDP, population growth rate, initial level of real GDP per capita, and human capital. The first two factors are considered as growth component, whereas the last two are related to the development component. Following Meon and Sekkat (2005), we introduced corruption, democracy and interaction term in the model as a determinant of productivity growth rate along with its other determinants to test the hypotheses whether corruption promotes or retard the economic growth as follows:

$$a_{it} = f(CORR_{it}, X_{j}, \mathbf{DEM}, CORR_{it} \times \mathbf{DEM})$$
(5)

Where CORR is the level of corruption; X_j is the jth conditioning variables such as government expenditure, investment-output ratio, population growth rate and education, and DEM indicates the democratic norms prevailing in the society.

ANALYTICAL FRAMEWORK

Combining equation (5) with equation (4), we get the equations for estimation. Equation (6) shows that impact of corruption and institutional features on growth without considering the impact of corruption on growth through institutional features.

$$GR_{it} = \alpha_0 + \alpha_1 CORR_{it} + \alpha_2 DEM_{it} + \sum \beta_j X_{ijt} + \mu_{it}$$
(6)

The dependent variable (GRit) is the growth rate of GDP per capita, and explanatory variables are corruption (CORRit), democracy (DEMit) and set of control variables (Xijt). Following Mo (2001) and, Pelligrini and Gerlagh (2004), we used four control variables such as government expenditures, investment-output ratio, population growth rate and education3 to analyze the impact of corruption on growth, thus:

X1 = Government expenditure	X2 = Share of investment in output
X3 = Population growth rate	X4 = Education

Subscript i is used to present the country (i = 1, 2,...,n), j for control variables (j = 1, 2,...,m) and t is used for time (t = 1, 2,...,T), and μ is an error term. The focus of study is on the impact of corruption on growth, so $\alpha 1$ is the coefficient of main interest. The positive sign of the coefficient of corruption $(\alpha_1 > 0)$ supports the hypothesis that corruption 'greases the wheels'; whereas its negative sign $(\alpha_1 < 0)$ implies that corruption 'sand the wheels'. The expected sign of the coefficients of institutional factor indicate that improvement in democratic norms enhances the economic growth; $(\alpha_2 > 0)$. We used interaction term in the model to test the 'grease the wheels' or 'sand the wheels' hypotheses as follows.

$$GR_{it} = \alpha_0 + \alpha_1 CORR_{it} + \alpha_2 DEM_{it} + \sum \beta_j X_{ijt} + \sum \alpha_3 (CORR_{it} \times DEM_{ijt}) + \mu_{it}$$
(7)

The parameters of interest are α_1 and α_3 . Under 'grease the wheels' hypothesis, corruption should have a positive impact on growth if the quality of institution such as democracy is very low. On the other hand, with high institutional quality the impact of corruption should become negative, and it supports the 'sand the wheels' hypothesis. In order to get these impacts, α_3 should be negative. Hence to hold the hypothesis i.e., corruption 'grease the wheels' α_1 should be positive with α_3 should be negative ($\alpha_1 > 0$ and $\alpha_3 < 0$). Under the 'sand the wheels' hypothesis, hypothesis,

³ Education is also used as a measure of human capital (see, Mina and Ndikumana, 2008).

corruption retards growth and becomes increasingly detrimental as democratic norms deteriorates. It is argued that corruption affects economic growth adversely if democratic norms are very high. In this case, the sign of corruption coefficient should be negative ($\alpha 1 < 0$) to still have a negative impact on growth if the quality of institution is very low. Besides, these hypotheses can be tested simply by differentiating equation (7) with respect to corruption as follows:

$$\frac{\partial GR}{\partial CORR} = \alpha_1 + \alpha_3 DEM \tag{8}$$

The coefficient α_3 captures the interaction effect of institution (democracy) and hence, effect of corruption on growth depends on democracy.

III. ECONOMETRIC MODEL AND ESTIMATION METHOD

Fixed effects model and random effects model are commonly used for the panel data analysis. Panel data set is preferred in empirical research because it combines the data for N cross-sections and t time periods. Panel data models examine fixed and/or random effects of individual or time. The main difference between fixed and random effect models lies in the role of dummy variables. In fixed effects model, parameter estimate of a dummy variable becomes a part of intercept; whereas in random effects model, it is a part of error term. Therefore, fixed effects model is called Least Square Dummy Variable (LSDV) model. In this method of estimation, constant is treated as cross-section specific, which permits a separate intercept for each cross-section. Thus, fixed effects model captures all effects, which are specific to a particular entity and do not change over time such as geographical factors, natural endowments and any other basic factor that vary among countries but remain constant over time.

The random effects model assumes that individual effect is not correlated with any regressor and estimated error variance is specific to cross-section units (or time). Therefore, a random effects model is also named as 'Error Component Model'. In this models, intercept and slope

parameters of regressors are the same across individual and their individual specific errors capture the difference among individuals (or time periods), and are not part of their intercepts. So, intercept for each section is not fixed, rather a random parameter. In addition, random effects specification also assumes that the effect is uncorrelated with the idiosyncratic residual. The selection of the model estimation format from fixed effects and random effects is based on the test, called Hausman test.

The violation of exogeneity assumption makes OLS estimators inconsistent and creates the problem of endogeneity. Following Mauro (1995), we examine the causality between variables, and found reverse causality between corruption and GDP per capita. It is extremely difficult to find appropriate instruments for all variables (Kotera et al., 2012), thus we use GMM estimation method, which uses internal (lagged) variables as the instruments. GMM estimation is generally applied in two stages. In the first stage, one gets initial estimator (un-weighted GMM estimator) whereas, the second stage is used to get weighted GMM estimators. The weighted GMM estimator is constructed using the weight matrix, which includes the residuals from the first stage. The second stage GMM estimators are more efficient than the first stage when weight matrix is properly chosen and has the smallest asymptotic variance among all other GMM estimators.

In GMM estimation method, Hansen J-statistic is used to test the over-identifying restrictions in the model. It is numerically identical to the Sargan test statistic. Hansen's J statistic is the most common diagnostic test used in GMM estimation to evaluate the suitability of the model. A rejection of the null hypothesis implies that the instruments do not satisfy the required orthogonality conditions-either because they are not truly exogenous or because they are being incorrectly excluded from the regression.

IV. DATA DESCRIPTION

We use the panel data set for developing eight (D-8) countries covering the period 1995-2013. Corruption Perception Index (CPI) is used to measure the corruption as it measures the perceived levels of public sector corruption (Transparency International, 2013), democracy and political stability for institutions and a set of control variables. CPI is constructed by Transparency International (TI) and is based on a 'poll of polls' showing the impressions of business people, the local population of relevant countries, and risk analysts, who have been surveyed. The index scaled the all countries from 0 to 10. The higher value of scale indicates lower level of corruption and vice versa. For clarity in interpretation, we transformed it by subtracting each nation's CPI value from 10 (10-CPI), so higher index value indicates higher corruption level.

Following Kalenborn and Lessmann, (2013), democracy is measured by the democracy index prepared by the 'The Economist Intelligence Unit'. According to the index methodology-2012, index range vary from 0 and 10, depending on the ratings for 60 indicator groups, which are divided into five categories; electoral process and pluralism, civil liberties, the functioning of government, political participation and political culture. Each nation falls into one of four regimes depending on its index value; full democracies (8-10), flawed democracies (6 to 7.9), hybrid regimes (4 to 5.9) and authoritarian regimes (below 4).

Other macroeconomic variables are GDP per capita, government expenditures, investment-output ratio, population growth rate and nation's education level. First one is used as dependent variables and remaining as control variables. GDP per capita is expressed in purchasing power parity (PPP) dollars per person. Government expenditure is measured by general government total expenditure as a percentage of GDP. Investment-output is measured by the ratio of total investment and GDP. Population is measured by the total population of the country and education level by the total adult literacy rate (% of people ages 15 and above). The data concerning GDP per capita, government expenditures, investment-output ratio and population is taken from The World Economic Outlook (WEO) database and on education from the World Development Indicators (WDI).

V. EMPIRICAL FINDINGS AND DISCUSSION

We have applied the Pairwise Dumitrescu Hurlin Panel Causality Test to check the causality and results are given in Table 1. The results show the bidirectional causality of GDP per capita with corruption and population at 5% level of significance, whereas, there is a unidirectional causality between GDP per capita and other variables. This reverse causality creates the endogeneity problem, so we used the GMM estimation method. We have estimated two models; without and with interaction term to see the impact of corruption and democracy on growth. In case of interaction term, we observe the mutual impact of corruption and democracy.

TABLE 1

Null Hypothesis	W-Stat	Zbar-Stat	p-Value
Corruption does not homogeneously cause GDP Per Capita	5.35821	2.84654	0.0044***
GDP Per Capita does not homogeneously cause Corruption	8.21428	5.59479	0.0000***
Govt. expenditure does not homogeneously cause GDP Per Capita	7.46095	4.86990	0.0000***
GDP Per Capita does not homogeneously cause Govt. expenditure	3.88544	1.42937	0.1529
Investment-output ratio does not homogeneously cause GDP Per Capita	4.30499	1.83308	0.0668*
GDP Per Capita does not homogeneously cause investment out-put ratio	10.5962	7.88678	0.0000***
Population does not homogeneously cause GDP Per Capita	9.20488	6.54800	0.0000***
GDP Per Capita does not homogeneously cause population	6.09321	3.55379	0.0004***
Education does not homogeneously cause GDP Per Capita	3.40315	0.96528	0.3344
GDP Per Capita does not homogeneously cause education	3.00527	0.58242	0.5603
Democracy does not homogeneously cause GDP Per Capita	5.48828	2.97170	0.0030***
GDP Per Capita does not homogeneously cause democracy	4.23143	1.76230	0.0780*

Pairwise Dumitrescu Hurlin Panel Causality Tests

Note: *, **, ***, respectively, denotes significant at 10%, 5% and 1% level of significance

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We estimated the panel data models using GMM method to investigate the impacts of corruption and democracy on economic growth. We used two stage least square (2SLS) weighting matrix and cross-section weights panel corrected standard error (PCSE) robust covariance methodology to address the problem of cross-section correlation (period clustering). We applied Hausman test and its p-value indicates that fixed effects estimates are better than random effects estimates, as shown in Table 2. The pvalue of Wald test and Hansen J-statistic confirm the suitability and validity of instruments. The values of R-square and adjusted R-square are reasonably high, which indicate that explanatory variables have significantly explained the variations in the dependent variable.

TABLE 2

		(-)	
Variable	(1)	(2)	(3)
Constant	-0.7666	-2.3989	-2.0634
Constant	(-3.317)***	(-3.906)***	(-3.4222)***
Communition	0.0563	0.7749	0.6094
Contuption	(1.009)	(2.718)***	(2.1787)**
Damoaraay		0.1792	0.7295
Democracy		(2.657)***	(1.9765)**
Covernment Expanditure	0.0166	-0.0918	-0.0156
Government Expenditure	(0.599)	(-1.714)*	(-0.4930)
Investment	0.0046	0.1468	0.1238
mvestment	(5.376)***	(4.680)***	(6.2093)***
Dopulation	0.3686	-0.0491	0.4145
Population	(4.006)***	(-0.232)	(3.4043)***
Education	-7.0316	-0.0081	0.0081
Education	(-0.664)	(-0.107)	(0.1422)
CDP non conits (1)	0.8803	1.0909	0.8347
ODF per capita (-1)	(29.505)***	(11.797)***	(17.9307)***
Corruption × Democracy			-0.3531
Colluption × Democracy			(-1.8506)**
R-squared	0.9986	0.9972	0.9985
Adj. R-squared	0.9985	0.9968	0.9983
J-statistic	3.4271	5.9495	3.2839
(p-Value)	(0.3303)	(0.2029)	(0.1936)
Wald Test p-Value	(0.0000)***	(0.0000)***	(0.0000)***
Observations	144	136	136
Hausman Test Stat.	25.4843	12.9593	338.5578
(P-Value)	(0.0003)***	(0.0731)*	(0.0000)***

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robust t-statistics based on cross-section weights (panel corrected standard error-PCSE) are reported.

The coefficients of control variables have expected signs and are statistically significant except education. The coefficient of investment-

The asterisks ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively. In parentheses,

output ratio is positive and significant in all three regressions. This implies that increase in investment-output ratio promotes economic growth in the sample countries. This result supports the findings of previous studies such as Méon and Sekkat, (2005) and Hodge, Shankar, Rao, and Duhs, (2011). The coefficient of population growth rate is positive and significant in all regressions except regression (2). This implies that increase in population growth rate increases the economic growth, because population growth is also used as a proxy for labor growth. The coefficient of adult literacy rate remained insignificant. The results for government expenditure coefficient are also not significant except regression (2). This implies that government expenditure retards economic growth when democracy variable is included in the regression.

The coefficient of corruption is insignificant in the absence of institution (democracy), but becomes significant when an institutional variable is included in the regression. The coefficient of institutional factor (democracy) is significant in the regressions (2) and (3). Regression (2) results indicate that 10% increase in corruption promotes economic growth by 7.7% and similar increase in democracy index increases the growth just by 1.7%. Similar findings are reported by the Drury, (2006), which indicate 1% increase in a democracy index leads to a 0.1% increase in the growth rate. This implies that the hypothesis, corruption 'grease the wheels' holds. The signs of corruption and democracy coefficients are positive, which indicate that both promote economic growth. Following Ahmad et al., (2012), We included lag value of GDP per capita by one period, as it affects the speed of convergence at which an economy converges toward its steady state, thereby affecting the growth rate.

MUTUAL EFFECT OF CORRUPTION AND DEMOCRACY

The results of regression (3) indicate the coefficient of the interaction term is negative and significant, which implies that conditionality matters. The coefficient of corruption is positive and significant, but its effect on economic growth depends on the institutional performance (democracy). We have calculated the marginal effect by inserting the value of estimated coefficients in equation (8) as follows.

$$\frac{\partial GR}{\partial CORR} = 0.6094 - 0.3531(DEM) \tag{9}$$

Equation (9) indicates that the marginal effect of corruption on economic growth depends on the degree of democracy. The corruption has respectively, positive association and negative association with growth for nations having poor democratic and strong democratic norms. The sign of the interaction effect of corruption with degree of democracy on growth changes at the margin when value of democracy index is about 5.6 points. If a country has a degree of democracy of more than 5.6 index points, the marginal effect of corruption on growth is negative and significant, which implies that corruption is not a suitable instrument to promote economic growth. This implies that corruption is always detrimental to growth in countries where institutions are effective like Bangladesh, Indonesia, Malaysia and Turkey in the sample nations (average democracy index value greater than 5.6). On the other hand, Egypt, Iran, Nigeria and Pakistan are the countries that have democracy index average value less than 5.6, so corruption promotes growth in these nations. In other words, corruption hypothesis' sand the wheels' is established in Bangladesh, Indonesia, Malaysia, Turkey, and 'greases the wheels' is established in Egypt, Iran, Nigeria and Pakistan.

VI. CONCLUSION AND POLICY IMPLICATIONS

We have tested two competing hypotheses whether corruption 'greases the wheels' or it 'sands the wheels' in D-8 countries using panel data models and GMM estimation method. The study examined the effect of corruption on growth and checked whether conditional cooperation between corruption and democracy matters or not in testing the above hypotheses. The empirical results indicate that the effect of corruption depends on the institutional performance, which implies that conditionality matters. The coefficients of corruption and democracy are positive and significant. But coefficient of interaction term is negative and significant. This implies that corruption promotes growth for lower level of democracy but retards growth in the countries experiencing democracy since longer. In our sample countries, Bangladesh, Indonesia, Malaysia and Turkey have average democracy index value greater than threshold level (5.6) whereas remaining countries Egypt, Iran, Nigeria and Pakistan has less than that. Thus, it is concluded that corruption lowers the growth in Bangladesh, Indonesia, Malaysia and Turkey, whereas, it promotes growth in Egypt, Iran, Nigeria and Pakistan. This

implies that corruption hypotheses 'sands the wheels' and 'greases the wheels' are established in Bangladesh, Indonesia, Malaysia and Turkey, and Egypt, Iran, Nigeria and Pakistan, respectively.

The empirical results of the study suggest that caution should be taken in drawing some solid policy implications, as the study used the panel data of only Muslim Developing Eight countries. But still, we believe that empirical results of the study suggest some very essential implications for understanding the impacts of public corruption on economic growth. Therefore, it is recommended that in order to reduce the effect of corruption on growth the promotion of democracy is indispensable, because with the progress of democracy, functioning of monitoring system improves and thereby investment increases that promotes economic growth. It certainly implies that future studies on corruption-growth relationship and its impact on society should pay careful attention to the governmental sphere, as this seems to have a potentially great influence on how residents evaluate government's functioning in terms of democracy.

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ESTIMATING MONETARY POLICY REACTION FUNCTION OF STATE BANK OF PAKISTAN

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Abstract. A near consensus in the contemporary monetary economics is that monetary policy can achieve its objectives more precisely if it is designed as a rule rather than discretion. The objective of this paper is to estimate monetary policy reaction function. For this purpose, Taylor type rules and McCallum rules are estimated using quarterly data of Pakistan economy over the period 1993 Q3 to 2013 Q2. Both types of rules have been modified by incorporating exchange rate management and interest rate smoothing as policy objectives. Moreover, we have found recursive estimates of the parameters to sort out policy inconsistency. We have also looked into the issue of nonlinearity of the monetary policy reaction function with regards to output gap and inflation rate assuming asymmetric preferences of monetary authority. We find that monetary authority in Pakistan does not follow Taylor rule as coefficient of output gap is negative and statistically insignificant and the coefficient of inflation rate, though statistically significant, is far below the benchmark value suggested by Taylor (1993). State Bank of Pakistan (SBP) is found to involve in exchange rate management and interest rate smoothing and this result is robust to different modifications in the Taylor rule. The parameters of output gap, inflation rate and differenced exchange rate, in the reaction function, are not stable over time and vary over the business cycle and across different inflationary regimes. The variation in the

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coefficient of output gap is found countercyclical while the coefficient of inflation rate follows the same pattern with respect to inflationary regimes. Coefficients of exchange rate and lagged interest rate remain almost stable. The threshold value of output gap is found 2.5% below which the response of interest rate to output gap fluctuations is positive but above which the response is insignificant. The threshold rate of inflation is found at 6% and coefficient of output gap is found positive only in high inflationary regime while the coefficients of inflation rate and exchange rate are significant only in low inflationary regime. Monetary authority responds to currency depreciation more strongly when interest rate is low compared to that when it is high. Moreover, the response of interest rate to output gap is significant only if currency depreciation is below threshold (estimated at 0.68) while response to exchange rate is significant only if there is high speed of depreciation (above threshold). The results are robust to inclusion of fiscal deficit in the Taylor rule. In Pakistan, fiscal deficit negatively affects interest rate which is because of the borrowing of government from State Bank of Pakistan (SBP) for budgetary support. In a modified version of the Taylor rule, interest rate is found to negatively respond to changes in growth rate of real GDP. Growth rate of monetary base negatively depends on the difference between nominal GDP growth rate and its average value indicating countercyclical response at the part of monetary authority. Moreover, growth rate of money exhibits strong inertia and is negatively related to currency depreciation. The coefficients in the McCallum rule too are not stable during the sample period. The coefficients of growth rate of nominal GDP and exchange rate are not stable over time, while the parameter capturing inertia is stable over the sample period. The response of monetary growth rate to nominal GDP growth rate and to exchange rate are significant only when nominal GDP is above its threshold value and/or when currency depreciates at higher rate.

Keywords: Nonlinear Taylor Rule, McCallum Rule, Threshold Inflation Rate, State Bank of Pakistan

JEL classification: E52, E58

I. INTRODUCTION

The prime objective of monetary policy is to stabilize some aggregate measure of prices along with stabilizing real economic activity and financial sector. Optimal monetary policy rules can help to achieve these objectives. The term optimal monetary policy is used in the conventional meaning of successfully stabilizing inflation around a low average level and with some concern for real stabilization in terms of stable economic activity.

In formulating monetary policy rule an important issue is the choice of appropriate variables to target. The vector of choice variables may include measures of real activity, prices, and relative price of the currency. The output gap may be taken as a measure of real activity but at the same time real GDP growth rate is an alternative choice. It should be noted however that maintaining a high growth rate in the long run is not possible through continuous lose monetary policy. For the prime objective of price stability, different aggregate measures of prices like CPI, WPI, GDP deflator, and weighted average of prices of commodities in core basket, can be a target. However, the most of the central banks in the world use inflation rate, rather than the price level, as a policy target. Similarly, for relative price of a currency, nominal spot exchange rate, nominal effective exchange rate or real effective exchange rate can be used. Furthermore, the choice of variables to be included in the rule also depends on whether or not the policy maker is forward-looking. In case of forward-looking policy, only future forecasts of the target variables appear on right hand side of the rule. But with backward-looking behavior, only lagged values are included.

Another issue in this regard is functional form of the reaction function. In one setting, just like Taylor (1993), monetary policy instrument can be formulated as linear function of the target variables. But at the same time this would be inappropriate if there are regime shifts in the history of monetary policy, (see for instance Leeper 2005)1. The choice of monetary policy instrument is yet another issue to be addressed. Besides the academic discussion regarding price level indeterminacy in

¹ For details on regime shifts see Hamilton (1989)

New Classical literature, most of the countries in the world are now using short term interest rate as operational target2.

For the case of Pakistan, there is good number of studies available on money-inflation relationship but the number is limited in case of rule based monetary policy. Qayyum (2006) identifies significant role of money in explaining inflation variability. Chaudhary and Choudhary (2006) find that inflation is imported rather than monetary phenomenon. Khan and Schimmelpfennig (2006) find inflation as monetary phenomenon in the long run but government support prices play significant role in the short run. Omer and Saqib (2009) conclude that Quantity Theory of Money does not hold in Pakistan as velocity is not constant. Agha et al (2005) find that interest rate channel along with credit channel and asset price channel are active in Pakistan, while Khan and Qayyum (2007) find that exchange rate channel and supply side shocks, compared to demand side shocks, play more important role. For the rule based policy, to our knowledge, there are only two studies that, based on simulation analysis, suggest adoption of rule, (for details see Malik and Ahmad 2010, and Tariq 2010)3. However, both the studies take interest rate as monetary policy instrument and assume backward looking behavior of monetary policy. Moreover, the output gap and the inflation rate are taken as target variables. Malik (2007) identifies, however, five objectives - output stabilization, price stability, exchange rate management, interest rate smoothing, and minimizing trade deficit of monetary policy in Pakistan. However, it is only positive analysis and normative analysis needs further investigation.

In Pakistan the Taylor rule has been estimated by Malik and Ahmed (2010) and Tariq (2010) but a reaction function with monetary base as policy instrument, like the McCallum rule, has not been estimated. Moreover, both the studies do not deal with the issue of policy consistency despite the fact that policy reversal has been observed most of the times in the history of Pakistan. Another area where empirical

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² For discussion on price level indeterminacy see Sargent and Wallace (1975)

³ There are, however, studies available that discuss the issue of inflation targeting in Pakistan. For details see Moinuddin (2009), Khalid (2006), Felipe (2009), Sinclair (2009), Akbari and Rankaduwas (2006), Bokil and Schimmelpfennig (2005), among others

literature, with regards to Pakistan economy, lacks is the nonlinearity of rules. There is only one study, Ahmed and Malik (2011) that highlight nonlinear aspect of monetary policy reaction function of Pakistan. However, even that study does not investigate the optimality of nonlinear Taylor rule. The underlying study contributes to the empirical literature of Pakistan by filling this literature gap and setting objectives accordingly.

In this context, the objective of the study is regarding positive analysis of monetary policy in Pakistan. More specifically, the objective is to estimate monetary policy reaction function with regard to Pakistan's economy. Keeping in view the existing literature with reference to Pakistan's economy, the focus is more on nonlinear specification along with focusing on different target variables and policy instruments. More specifically, we considered alternative measures of target variables, like the output gap, the GDP growth rate, the inflation rate, the lagged interest rate, and the exchange rate. This has been done for both monetary policy instruments - interest rate and monetary base - and two types of functional forms - linear and non-linear. Policy consistency, through parameters stability in the reaction function, is also investigated.

For achieving these objectives, we have estimated various types of monetary policy reaction functions for Pakistan by using quarterly data over the period 1993Q3 to 2012 Q2. For policy consistency, recursive estimates of the parameters in the reaction function are found.

The study finds that State Bank of Pakistan has not been following the Taylor rule and Taylor principle is not satisfied. There is strong inertia found in the monetary policy instrument and exchange rate significantly explains changes in interest rate. Policy, throughout the sample period, has not been consistent as parameters in the policy reaction function are found to be unstable. Nonlinearity has been observed in the reaction function, over the business cycle4, with respect to coefficients of the inflation rate and the exchange rate. The threshold for the output gap is found to be 2.5% and policy behavior is found to be

⁴ Output gap is used as a measure of business cycle in Pakistan as no formal data is available. Positive values of output gap indicate boom while negative values indicate recession in the economy.

different, with respect to this threshold, regarding the output gap and the exchange rate. Similarly, the threshold rate of inflation is found to be about 6%5 and policy behavior changes at this threshold with respect to the output gap, the inflation rate, and the exchange rate. Moreover, the results of McCallum rule are according to theory and are in conformity with the results of Taylor rule, to the extent that exchange rate management is significant determinant of policy instrument and strong inertia is also found in it. The McCallum rule also exhibits nonlinearity with respect to GDP growth rate and exchange rate. Finally, regarding normative analysis, it has been found that Taylor (1993) rule can significantly perform well in an estimated model for Pakistan economy and nonlinearity in the reaction function does not improve the performance of the rule.

Rest of the study proceeds as follows. In the first step linear Taylortype rules are estimated with four specifications, results of which are given in section 2. Then Taylor rule is extended in two directions: one with the lagged values of all independent variables and in the second, forward-looking Taylor rule is estimated. Results of these two extended rules are explained in section 3. The Taylor Rule is also estimated with a modification that stabilization of real GDP growth rate, instead of the output gap, is assumed an objective of monetary policy. Results of this modified Taylor rule are explained in section 4. Being a developing country, most of the time, policy reversal is observed in Pakistan. Hence section 5 deals with the parameters stability of the Taylor rules. To investigate, whether or not the monetary authority in Pakistan exhibits opportunistic behavior, non-linear Taylor rules are also estimated and results are given in section 6. Another objective of this section is to explore whether there exist threshold values for target variables beyond which monetary authority alters its behavior. The next three sections present results of McCallum rules: section 7 deals with the linear McCallum rules; section 8 present results of parameter stability in the McCallum rule: results of nonlinear McCallum rule are elaborated in

⁵ The threshold inflation rate is lower than the average inflation rate (8.68%) during the sample period. The lower value of threshold is found because of the low inflation rates during 1998 to 2003 when economy was in recession. Moreover, it is the rate at which policy maker changes its behavior keeping in view the current values of output gap, exchange rate, lagged interest rate etc.

section 9 and finally concluding remarks and policy recommendations are given in section 10.

II. LINEAR TAYLOR RULES

In line with the first objective of the study, in the first step, four specifications of linear Taylor rule are estimated. As benchmark, the first specification is the standard Taylor rule in which the short term interest rate responds to deviations of actual output from potential level and that of inflation from the target.

Results in the second column of Table 1 (Rule 1) show that monetary authority in Pakistan does not follow Taylor rule. The coefficient of the output gap is negative and statistically insignificant. Moreover, the coefficient of the inflation rate, though statistically significant, is far below the benchmark value (1.5, in Taylor 1993)6 and even does not satisfy the Taylor principle (the coefficient is greater than 1). Adjusted Rsquare is quite low which show the presence of objectives of monetary policy in Pakistan other than output and price stability. As the variables are non-stationary at level, therefore, there is a risk of getting spurious results. However, if the variables are cointegrated then OLS estimates are super consistent (Enders 2009). The ADF (Augmented Dickey Fuller) statistics along with the probability value at the bottom of the column show that the variables are cointegrated and thus results of the model are not unreliable because of non-stationarity of the data.

Durbin-Watson is too low which might be an indication of the presence of autocorrelation. However, autocorrelation is not the only cause of low value of Durbin-Watson; there might be the problem of misspecified dynamics in the model. More specifically Sargan suggested testing the misspecified dynamics if Durbin-Watson is low and recommended modeling of autocorrelated errors only if dynamics of the model are properly specified (Thursby 1981). Therefore, we have used Likelihood ratio test to investigate whether the low Durbin-Watson value is because of autocorrelated errors or it is because of missing variables from the equation.

⁶ In some studies this benchmark value is taken as 0.5 (Adema, 2003). According to our formulation this value is taken as 1.5.

Under the null hypothesis that errors of the Taylor rule equation are autocorrelated, we find the value of likelihood ratio as 12.46 which is significant at 1%. Hence, we reject the null hypothesis of autocorrelated errors in favor of the alternate hypothesis that the Taylor rule equation is not properly specified for the case of Pakistan and there are missing dynamics from the equation that cause low value of Durbin-Watson indicating that the interest rate smoothing might be one of the objectives of monetary policy in Pakistan.

	Rule 1	Rule 2	Rule 3
Constant	6.58	7.35	0.57
	(0.00)	(0.00)	(0.16)
Y	-0.03	0.12	0.12
	(0.86)	(0.54)	(0.03)
Inf	0.39	0.21	0.03
	(0.00)	(0.09)	(0.39)
i(-1)			0.89
			(0.00)
d(er(-1))		0.78	0.29
		(0.02)	(0.00)
Adjusted R-square	0.19	0.24	0.93
DW Statistic	0.12	0.20	1.57
LM Statistic	60.99	54.46	5.87
	(0.00	(0.00)	(0.21)
LR Stats	12.46		
	(0.00)		
ADF of resids	-2.06	-1.92	-6.48
	(0.04)	(0.05)	(0.00)

TABLE 1

Results of Linear Taylor Rules

* y denotes output gap, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate. Probability values are given in parentheses.

In the next step we have estimated modified versions of the standard Taylor rule so that the correct form of the monetary policy reaction function can be specified and other objectives of monetary policy can be sorted out. In this regard, the Taylor rule is augmented with the lagged difference of exchange rate7. Results in the third column of Table 1 (Rule 2) show that, in Pakistan, exchange rate stabilization is preferred over inflation and output gap stabilization. Coefficient of lagged differenced exchange rate is positive and statistically significant indicating that the local currency depreciation in current period leads to tightening of monetary policy in the future periods. Interestingly, the coefficient of output gap turned to positive when lagged differenced exchange rate is added in the Taylor rule. Significance of the coefficient of differenced exchange rate in Taylor rule indicates that the previous version of the rule (Rule 1) was misspecified. So that version was subject to the omitted variable bias and the estimate of the coefficient of output gap was downward biased as the correlation coefficient between lagged differenced exchange rate and output gap is negative. However, the change of sign is not so critical, as output gap remains insignificant before and after inclusion of exchange rate in the model.

Adjusted R-square is somewhat higher compared to that in the standard Taylor rule specification but still it is quite low. Moreover, inclusion of exchange rate did not improve the value of Durbin-Watson statistic indicating incomplete dynamics of the model and pointing to motive of interest rate smoothing at the part of State Bank of Pakistan. The ADF statistics of residuals show that the variables of the model are cointegrated.

Finally, both the lagged differenced exchange rate and lagged interest rate are incorporated in the Taylor rule: results are given in the last column of table 1 (Rule 3). This specification gives reasonably different results compared to those of the previous two specifications. The coefficient of lagged interest rate is quite high (0.89) indicating significant inertia in the monetary policy operating instrument. The coefficient of exchange rate is still positive and statistically significant but is lower than its value in the previous specification. This indicates that lagged values of the exchange rate and the interest rate are positively correlated. However, the long run coefficient is 2.64. Moreover, the coefficient of output gap in this case is positive and statistically

⁷ Exchange rate is defined as the Pak-Rupees price of one US dollar.

significant and its long run value is quite high8. The coefficient of inflation rate is close to zero and is statistically insignificant. This coefficient, before inclusion of lagged interest rate, was statistically significant but it turned out insignificant when we included lagged interest rate as one of the regressors. Actually, changes in interest rate, driven by monetary policy, transmit into output and inflation rate after a time lag. So lagged (current) interest rate is associated with the current (future) inflation rate. Therefore, inclusion of lagged interest rate made the coefficient of inflation rate insignificant. Moreover, the coefficients of equation without lagged interest rate are interpreted as long run coefficients while those of the dynamic model are related to short run. The long run coefficient of inflation rate is significant but that for short run is insignificant. So, it can be concluded that inflation rate and interest rate, in Pakistan, are associated in the long run but they are not related to each other at quarterly frequency and coefficient of inflation rate in the equation of interest rate is insignificant once the effect of last quarter's interest rate is controlled.

The adjusted R-square has improved considerably and it shows that most of the variation in the interest rate is determined by its own history. The ADF statistics of residuals show that the variables of the model are cointegrated. The value of Durbin-Watson has also improved a lot. As the model now contains lagged dependent variable as one of the regressors, Durbin-Watson test cannot be used for autocorrelation. Therefore, we have used Lagrange Multiplier (LM) test for detection of autocorrelation in the error term. The LM stats is quite low with high (greater than 10%) probability value indicating that autocorrelation is removed after incorporating lagged interest rate in the model. This version of the Taylor rule portrays the policy behavior of SBP much better.

It can be concluded from the results of this section that, in Pakistan, the interest rate smoothing and the exchange rate stability get priority over the output gap and price stability. Interest rate is predominantly dependent on its own lagged values and the three target variables (output gap, inflation rate, and exchange rate) explain little variation in the

⁸ The coefficient of output gap is 0.12 in the dynamic model (with lagged interest rate as regressor). With value of coefficient of lagged interest rate 0.89, the long run value of coefficient of output gap is 1.09.

interest rate. It is worth mentioning that Taylor principle is satisfied in none of the specifications.

III. MODIFIED TAYLOR RULES

MODIFICATION WITH RESPECT TO TYPE OF DATA USED

At the time of deciding on monetary policy instrument data that is required for Taylor rule is actually not available to policy makers. More specifically, the data on output and inflation rate are available only at the end of the period but monetary policy decision is taken at the start of the period and revised most of the times during the period9. So Taylor rule is modified by incorporating fourth lagged values of the output gap and inflation rate instead of contemporaneous values. Results of this specification (Table 2) are in conformity with those found in the previous section. Lagged interest rate has coefficient which is close to one and the exchange rate and the output gap have positive and statistically significant coefficients along with insignificant coefficient of inflation rate. Adjusted R-square is considerably high and LM stats indicate no autocorrelation up to the fourth lag. ADF statistics indicate that the variables of the model are cointegrated and results of the regression are not spurious.

	Backward Looking	Forward Looking
Constant	1.26	-0.19
	(0.00)	(0.39)
Y	0.19	0.15
	(0.00)	(0.00)
Inf	0.02	0.06
	(0.55)	(0.02)

TABLE 2

Results of Modified Linear Taylor Rule

⁹ Data on GDP is available at the end of each year and inflation rate is published on monthly basis. Target for M2 is set at the start of each fiscal year and currently Monetary Policy Committee decides on discount rate after every two months. Moreover data on GDP is revised after one year and final data is published after two years.

	Backward Looking	Forward Looking
i(-1)	0.82	0.92
	(0.00)	(0.00)
d(er(-1))	0.32	0.36
	(0.00)	(0.00)
Adjusted R-square	0.94	0.93
DW Statistic	1.55	1.41
LM stats	5.63	
	(0.23)	
ADF of resids	-6.59	-4.99
	(0.00)	(0.00)

For backward-looking rule, y is lagged output gap, inf is lagged inflation rate. For forward-looking rule, y and inf are, respectively, future expected values of output gap and inflation rate. Probability values are given in parentheses. LM stands for Lagrange Multiplier

Another issue in formulating monetary policy is the transmission lags: monetary policy decisions that are taken today can affect the economy only after certain time period. In this context monetary policy should be forward-looking. Instead of reacting to current values of the output gap and the inflation rate, the central bankers design monetary policy keeping in view the future forecast of these variables. To investigate this issue in Pakistan we have estimated Taylor rule by incorporating future expected values of inflation and output gap and estimated the model through Generalized Method of Moments (GMM). Results in table 2 indicate that all the variables in the rule are statistically significant and have theoretically right sign. Interestingly, the coefficient of inflation rate turned significant in this forward-looking Taylor rule. This result coupled with the one found for backward looking model indicates that SBP is backward looking for the case of output and is forward looking in case of inflation rate. SBP regularly publish inflation forecast at quarterly frequency. The forecast of output is not available and is difficult to forecast. Therefore, it is feasible for SBP to take policy decisions on the basis of future forecast of inflation rate but for the case of output it can at best be reactionary. Indeed, reacting to future forecasted changes in inflation rate is desirable because transmission of monetary policy involves time lags. The magnitude of this coefficient is still low compared to the value of this coefficient that is required by the satisfaction of Taylor principle. The magnitude of the coefficient of

inflation is 0.06, which after adjustment is 0.75 for the long run (less than 1).

Results of this section confirm those of the last section that Taylor rule is not followed by the State Bank of Pakistan and Taylor principle is satisfied in none of the specifications.

LINEAR TAYLOR RULE WITH REAL GDP GROWTH RATE AS TARGET VARIABLE

Results obtained so far show that Taylor rule does not fit the Pakistani data well and interest rate smoothing and exchange rate stability are preferred, in policy choices, to inflation and output stabilization and Taylor principle is violated in almost all of the specifications of linear and nonlinear Taylor rules. Therefore, to further investigate the monetary policy reaction function we have modified the Taylor rule in such a way that real GDP growth rate, instead of the output gap, is taken as target variable. Again three specifications of this modified rule are estimated; results are given in Table 3.

	Rule 1	Rule 2	Rule 3
Constant	9.72	9.69	0.28
	(0.00)	(0.00)	(0.63)
Y	-0.57	-0.53	-0.01
	(0.00)	(0.00)	(0.86)
Inf	0.32	0.24	0.08
	(0.00)	(0.01)	(0.01)
i(-1)			0.89
			(0.00)
d(er(-1))		0.50	0.21
		(0.09)	(0.03)
Adjusted R-square	0.34	0.36	0.93

TABLE 3

Results of Taylor Rule with GDP Growth

	Rule 1	Rule 2	Rule 3
DW Statistic	0.41	0.42	1.44
LM stats	49.45	46.64	6.86
	(0.00)	(0.00)	(0.14)
ADF of resids	-2.77	-2.83	-6.09
	(0.00)	(0.00)	(0.00)

* y denotes real GDP growth rate, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate.

In the first specification, the interest rate is regressed on real GDP growth rate and the inflation rate. Results in the second column of table 3 (Rule 1) show that monetary authority adopts pro-cyclical policy: the coefficient of GDP growth rate is negative indicating that higher growth rate leads to easing of monetary policy. This result seems consistent with the historical facts. In the aftermath of September 11, 2001 foreign exchange inflow made expansion in the stock of money which put downward pressure on the interest rate. SBP did not try to reverse the situation and kept monetary policy in expansionary mode as at that time economy was recovering from recession that started in late 1990s. However, after 2007 inflation reached above 20 % per year and real GDP growth rate was just positive. SBP was in dilemma of controlling inflation vs. expansion of business activity. Therefore, it did not lower interest rate despite the fact that real GDP growth rate was almost zero.

The coefficient of the inflation rate is positive and statistically significant but it is still far below 1 (requirement of Taylor Principle to be satisfied); the benchmark value for the satisfaction of Taylor principle. Moreover, the adjusted R-square and Durbin-Watson statistics are quite low indicating that there are target variables other than GDP growth rate and inflation rate that are part of monetary policy reaction function in Pakistan. Therefore, we extended this linear and modified Taylor rule in two ways; the reaction function is first augmented by lagged differenced exchange rate and then by lagged interest rate.

The third column of Table 3 show that results regarding the coefficients of GDP growth rate and the inflation rate are robust and do not change after incorporating exchange rate as an extra target variable.

Improvement in adjusted R-square and Durbin-Watson statistics is negligible. The coefficient of exchange rate is positive but it is significant only at 10% level of significance. This result confirms the results of all the specifications we have estimated so far that exchange rate stabilization is one of the objectives of monetary policy in Pakistan. In the last specification, the interest rate is regressed on the inflation rate, the exchange rate, the GDP growth rate, and the lagged interest rate. Results in the last column of Table 3 show that once lagged interest rate is included as one of the regressors, coefficient of GDP growth rate does not remain significant. Changes in interest rate, driven by monetary policy, transmit into output and inflation rate after a time lag. So, changes in interest rate provide incentive for private investors to change their investment decision, thereby affecting the future GDP growth rate. Therefore, inclusion of lagged interest rate made the coefficient of GDP growth rate insignificant 10. The coefficient of lagged interest rate is 0.89 and adjusted R-square is 0.93. Again it is found that interest rate in Pakistan is predominantly determined by its own past values which indicates motive of interest rate smoothing at the part of SBP. Moreover, Durbin-Watson stats improved and the LM stats show that there is no autocorrelation up to fourth lag in the final version of the rule.

IV. (IN)STABILITY OF PARAMETERS IN THE TAYLOR RULES

In Pakistan many times policy reversal has been observed which was either due to change of the government or because economy was subject to external shocks. For instance, at the end of 1990s, tight monetary policy was in place but after September 11, 2001 due to inflow of foreign exchange monetary policy went into expansionary mode. That expansionary stance was not because of the recession in the economy at that time; rather it was because of foreign exchange inflow and resultant increase in money supply. In this context stability of the parameters in estimated Taylor rule has been investigated. For this purpose, Rule 3 from section 2 has been selected in which interest rate responds to the

¹⁰ It is noteworthy that the regression results of the last (generalized) specification are not subject to the problem of multicollinearity. Rather, the results of the first and second models (rule 1 and 2) are subject to omitted variable bias.

output gap, the inflation rate, lagged differenced exchange rate and lagged interest rate. Recursive estimates of that specification have been found by estimating the rule in first sub-sample, 1993Q3 to 1997Q4, and then extending the sample by including one extra observation each time. The parameters' estimates, so found, are then plotted in Figure 1 to find the evidence of policy reversal.

Pakistan Economy was in expansionary phase during 2003 through 2007. During this period the coefficient of the output gap remained negative and it starts increasing in 2008 when contraction of the business activity started. The coefficient of output gap is thus found moving counter cyclically around its long run average value. The coefficient of inflation moves on a path that is mirror image of the path of the coefficient of output gap. During the expansionary phase of the economy, the coefficient of inflation was above its average value while during contractionary phase it was below average. However, it is worth noting that during contraction that started in 2008, inflation rate was high -aperiod of stagflation. In that period, the coefficient of inflation rate was quite low. This was due to the fact that inflation rate, in that period, touched local maxima but SBP did not increase interest rate due to stagflation in the economy and real interest rate became negative. The coefficient of lagged interest rate remained around 0.85 and no clear pattern has been observed except that the inertia effect was high in high inflationary regime of 2008 to 2010.

The coefficient of exchange rate was stable and high during the expansionary phase of the economy and low and somewhat volatile during the contractionary phase. Moreover, this coefficient was low when exchange rate depreciation was high and the coefficient was high in the period when exchange rate depreciation was low. Again after 2008, the coefficient of differenced exchange rate started decreasing; currency depreciated at a very fast pace but SBP did not raise interest rate to that extent because of the fear of slowing down the economic activity.

These findings highlight that the coefficients of output gap, inflation rate and exchange rate did not remain stable during the sample period and fluctuation of the coefficients depend on business activity, inflationary regime and the high or low values of the exchange rate depreciation. These results motivated us to investigate the non-linear Taylor rule for Pakistan.

Figure	1
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V. NONLINEAR TAYLOR RULES

Policy makers may respond to state of the economy in a nonlinear way. More specifically, the coefficients of the target variables in one regime may differ from those in other regimes. For instance, policy makers' preferences may differ in boom and recession or in high and low inflationary regimes. We have used threshold regression for estimating nonlinear policy reaction function. Threshold values of output gap, inflation rate, exchange rate, and interest rate are estimated and then policy behavior above and below the threshold values of these variables are estimated. In all nonlinear specifications of the Taylor rule, Durbin-Watson statistic is low and LM test indicate the presence of autocorrelation which is not removed even if we include 5 lags of the dependent variable. So, for this section, instead of losing so many degrees of freedom by incorporating too many lags, we used the Newey-West standard errors. The problem of autocorrelation may cause biasness in the estimates of standard errors of the coefficients, which makes the results unreliable. The use of corrected standard errors for autocorrelation and heteroscedasticity can solve the problem of reliability of results.

NONLINEARITY WITH RESPECT TO ECONOMIC ACTIVITY

A dummy variable with values 1 for boom (positive output gap) and 0 for recession (negative output gap) is constructed and then assuming zero value of the output gap as threshold, four specifications of Taylor rule are estimated, the results of which are given in table 4. In each of the specifications one of the target variables is multiplied with dummy variable so that policy behavior regarding that variable can be estimated in boom and recessionary regimes. It is interesting to note that in all of

the four specifications adjusted R-square is above 0.9, Durbin-Watson statistic is above 1.57, the coefficient of lagged interest rate is about 0.9 and the coefficient of lagged differenced exchange rate is about 0.3. Hence the result that there is strong inertia in the interest rate and interest rate positively respond to currency depreciation is found robust. In the Rule 1 it is found that policy response regarding business activity is same in boom and recession as the coefficient of output gap is statistically insignificant in both states of the economy. Results of Rule 2 show that the interest rate positively responds to the inflation rate only in boom. But this response is weak as the null hypothesis that this coefficient is zero can be rejected only with 90% confidence. Moreover, Taylor principle is still not satisfied as the value of response coefficient of inflation is less than 1. The hypothesis that response coefficient of inflation is same in two states of the economy can only be rejected with 90% confidence. Results of Rule 3 show that the extent of interest rate smoothing does not vary over the business cycle. Finally, the results in last column of table 4 show that response coefficient of exchange rate is higher in boom than that in recession. However, this difference is not statistically significant. Overall it can be concluded that policy behavior is not altered if we consider zero value of output gap as threshold.

It might be possible however, that policy maker has a threshold value of the output gap that is different from zero. To investigate this issue, we have estimated threshold value of the output gap in the policy reaction function and it is found 2.5%. Results of Rule 1 with this threshold value of the output gap indicate that interest rate positively and significantly respond to output gap only if the latter is below its threshold value. In the long run the coefficient of the output gap, when it is below threshold value, is estimated at 1.45. Hence policy maker responds to the output gap in a manner that is consistent with the prescription of Taylor rule only if there is slowdown in the business activity and when economic activity is flourishing then focus is shifted from the output gap to other objectives. The coefficients of inflation rate and lagged interest rate are same no matter output gap is above or below the threshold. Although, the magnitudes are somewhat different in two regimes (both coefficients are higher in magnitude when there is low growth period) but the difference is not statistically different as indicated by the F-stats at the bottom of the table. In the fourth specification we found asymmetric response of

interest rate to exchange rate in two states of the economy. The coefficient of exchange rate is positive only when output gap is below threshold value, otherwise it is negative.

TABLE 4

Results of Nonlinear Monetary Policy Reaction Function (Nonlinearity w.r.t Output Gap)

Threshold Value	Ru	ıle 1	Ru	ıle 2	Ru	le 3	Ru	le 4
of Output Gap	0	2.5	0	2.5	0	2.5	0	2.5
С	0.47	0.67	0.35	0.62	0.53	0.67	0.56	0.65
	(0.49)	(0.18)	(0.51)	(0.21)	(0.30)	(0.25)	(0.25)	(0.20)
Y			0.04	0.17	0.05	0.18	0.11	0.17
			(0.55)	(0.01)	(0.55)	(0.02)	(0.03)	(0.00)
π	0.04	0.03			0.03	0.03	0.03	0.03
	(0.35)	(0.66)			(0.46)	(0.49)	(0.34)	(0.43)
R(-1)	0.89	0.89	0.89	0.90			0.88	0.90
	(0.00)	(0.00)	(0.00)	(0.00)			(0.00)	(0.00)
DER	0.30	0.28	0.35	0.27	0.34	0.27		
	(0.03)	(0.04)	(0.01)	(0.04)	(0.01)	(0.06)		
y*Dum	0.15	0.04						
	(0.27)	(0.66)						
y*(1-Dum)	0.09	0.16						
	(0.52)	(0.02)						
π*Dum			0.08	-0.02				
			(0.06)	(0.63)				
π*(1-Dum)			0.01	0.03				
			(0.74)	(0.36)				
R(-1)*Dum					0.92	0.84		
					(0.00)	(0.00)		
R(-1)*(1-Dum)					0.86	0.90		
					(0.00)	(0.00)		
DER*Dum							0.50	-1.98
							(0.00)	(0.03)

Threshold Value	Rı	ule 1	Rule 2		Rule 3		Rule 4	
of Output Gap	0	2.5	0	2.5	0	2.5	0	2.5
DER*(1-Dum)							0.27	0.28
							(0.02)	(0.02)
Adjusted R- square R-square	0.93	0.93	0.94	0.94	0.94	0.94	0.94	0.94
DW Statistic	1.57	1.59	1.70	1.60	1.61	1.60	1.63	1.69
LM stats	17.64	15.40	20.19	14.71	19.04	15.50	14.88	14.91
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
F stats	0.11	1.12	2.95	1.89	2.22	2.58	1.27	3.97
	0.74	0.29	0.09	0.17	0.14	0.11	0.26	0.05

y denotes output gap, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate. F-stats is calculated with the null hypothesis that coefficient of a target variable is same above and below threshold value. Dum is the dummy variable which has value 1 when output gap is above threshold value and zero otherwise.

It is noteworthy that there is high R-square in each specification of nonlinear Taylor rule but coefficients are not significant in all of the models. This may be due to the problem of multicollinearity. We therefore, used Variance Inflation Factor (VIF) to formally test the multicollinearity problem. Results in table show that for all of the regressors VIF is considerably lower than the benchmark value of 10. So, multicollinearity is not the cause of the problem. A possible explanation of high R-square combined with insignificant coefficients can be the strength of association between interest rate and its lagged values. To test this, we regressed interest rate only on lagged interest rate and interestingly, the R-square was found 0.91. Hence, in a regression with lagged interest rate as a regressor, R-square will be above 0.91 no matter the coefficients of other regressors are significant or not.

NONLINEARITY WITH RESPECT TO INFLATION RATE

In this step two regimes are separated on the basis of threshold inflation rate. The high inflationary regime is the one with inflation rate above threshold and the low inflationary regime is the one with inflation rate below threshold inflation rate. Results in table 5 indicate that the threshold inflation rate is found 6.02%. Again four specifications of the

nonlinear Taylor rule are estimated: in each specification dummy variable, with value 1 for inflation rate above threshold, is multiplied by one of the target variables.

TABLE 5

Results of Nonlinear Taylor Rule (Nonlinearity w.r.t Inflation Rate)

	Rule 1	Rule 2	Rule 3	Rule 4
С	0.33	-0.17	0.19	0.07
	(0.62)	(0.77)	(0.73)	(0.89)
Y		0.21	0.19	0.08
		(0.00)	(0.01)	(0.09)
π	0.04		0.08	0.13
	(0.33)		(0.12)	(0.00)
R(-1)	0.89	0.89		0.87
	(0.00)	(0.00)		(0.00)
DER	0.31	0.25	0.25	
	(0.02)	(0.04)	(0.06)	
y*Dum	0.19			
	(0.11)			
y*(1-Dum)	0.06			
	(0.67)			
π*Dum		0.08		
		(0.07)		
π* (1-Dum)		0.34		
		(0.02)		
R(-1)*Dum			0.86	
			(0.00)	
R(-1)*(1-Dum)			0.96	
			(0.00)	
DER*Dum				-0.05
				(0.71)

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	Rule 1	Rule 2	Rule 3	Rule 4
DER*(1-Dum)				0.69
				(0.00)
Adjusted R-square	0.94	0.94	0.94	0.95
DW Statistic	1.57	1.44	1.45	1.46
F stats	0.81	7.21	4.35	2.56
	(0.37)	(0.01)	(0.04)	(0.00)

y denotes output gap, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate. F-stats is calculated with the null hypothesis that coefficient of a target variable is same above and below threshold value. Dum is the dummy variable which has value 1 when inflation rate is above threshold value (6.02%) and zero otherwise. Probability values are given in parentheses

Results in Table 5 show that in all four specifications adjusted Rsquare is above 0.9, Durbin-Watson statistic is about 1.5, the coefficient of lagged interest rate is about 0.9 and the coefficient of exchange rate is about 0.3. Moreover, the F-statistics show that coefficients of all the target variables other than that of the output gap are not equal in two inflationary regimes. Results in the second column of the table indicate that the coefficient of output gap is positive and statistically significant only if economy is in high inflationary regime. But the coefficient of inflation rate is significant in both regimes. However, this coefficient in high inflationary regime has a value which is close to zero and Taylor principle is satisfied only in low inflationary regime. This is because SBP does not increase interest rate to that extent when inflation crosses certain threshold value. For instance, after 2007 inflation jumped to historical high rates (above 25%) but SBP increased policy rate to just 15%. Inertia in the interest rate has almost same coefficient values in two regimes; however, these coefficients are statistically different. Similarly, it is found that SBP increases interest rate in response to currency depreciation only if there is low inflationary regime.

NONLINEARITY WITH RESPECT TO LAGGED INTEREST RATE AND EXCHANGE RATE

Nonlinearity in the Taylor rule is also investigated with respect to lagged interest rate. Time period when the interest rate is above threshold value is the high interest rate regime and vice versa. Threshold value of interest rate, above and below which policy behavior is expected to be different, is found 7.45%. Results in Table 6 show that adjusted R-square, Durbin-Watson statistics, the coefficient of inflation rate and the coefficient of exchange rate are same as those found in the case of nonlinearity with respect to the inflation rate. Again, as F-statistics show, response coefficients of all the target variables except that of output gap are significantly different in two different regimes of interest rate. Response of the interest rate to the output gap is significant only if interest rate is already high in the economy. On the other hand, the response of interest rate to inflation rate is significant only when the interest rate is already low. Similarly, it is found that inertia in interest rate is more prevalent when interest rate is low. Finally, monetary authority responds to currency depreciation more strongly when interest rate is low compared to that when it is high.

F-statistics in the last four columns of Table 6 signify that nonlinearity with respect to exchange rate is significant only when the dummy variable, with value 1 for exchange rate depreciation above threshold estimated at 0.68, is multiplied with exchange rate. Response of interest rate to currency depreciation is stronger when magnitude of currency depreciation is high. One of the explanations of this result is that, in Pakistan, central bank intervenes in the foreign exchange market, through foreign exchange reserves, to stop currency depreciation. But when depreciation is high and persistent and foreign exchange reserves are low then central bank focus on other instruments, like increase in interest rate, to stabilize exchange rate.

TABLE 6

							-	
	Non	linearity w.	r.t Interest I	Rate	Nonl	inearity w.	r.t Exchange	Rate
	Rule 1	Rule 2	Rule 3	Rule 4	Rule 1	Rule 2	Rule3 3	Rule 4
С	0.50	-0.22	-0.05	0.36	0.51	0.76	0.67	0.56
	(0.41)	(0.77)	(0.94)	(0.40)	(0.36)	(0.20)	(0.26)	(0.30)
Y		0.12	0.17	0.10		0.16	0.14	0.15
		(0.00)	(0.00)	(0.02)		(0.00)	(0.01)	(0.00)
π	0.03		0.03	0.05	0.04		0.03	0.02

Results of Nonlinear Taylor Rule (Nonlinearity w.r.t Interest Rate and Exchange Rate)

	Nor	Nonlinearity w.r.t Interest Rate			Nonlinearity w.r.t Exchange Rate			
	Rule 1	Rule 2	Rule 3	Rule 4	Rule 1	Rule 2	Rule3 3	Rule 4
	(0.39)		(0.44)	(0.09)	(0.30)		(0.57)	(0.64)
R(-1)	0.89	0.96		0.90	0.89	0.89		0.90
	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)		(0.00)
DER	0.31	0.29	0.31		0.26	0.27	0.27	
	(0.01)	(0.02)	(0.01)		(0.05)	(0.05)	(0.08)	
y*Dum	0.15				0.01			
	(0.02)				(0.96)			
y*(1-Dum)	0.05				0.16			
	(0.58)				(0.01)			
π*Dum		0.03				0.04		
		(0.47)				(0.33)		
π*(1-Dum)		0.16				-0.01		
		(0.08)				(0.78)		
R(-1)*Dum			0.94				0.91	
			(0.00)				(0.00)	
R(-1)*(1-Dum)			1.12				0.87	
			(0.00)				(0.00)	
DER*Dum				0.18				0.41
				(0.10)				(0.00)
DER*(1-Dum)				0.89				0.12
				(0.00)				(0.43)
Adjusted R- square R-square	0.93	0.94	0.94	0.94	0.94	0.94	0.94	0.94
DW Statistic	1.55	1.70	1.72	1.73	1.62	1.61	1.68	1.63
F stats	0.76	4.07	6.08	9.25	2.22	2.73	2.48	3.81

y denotes output gap, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate. F-stats is calculated with the null hypothesis that coefficient of a target variable is same above and below threshold value. For second to fourth columns Dum is the dummy variable which has value 1 when interest rate is above threshold value (7.45%) and zero otherwise. For last three columns Dum is the dummy variable which has value 1 when exchange rate is above threshold value (0.68%) and zero otherwise.

0.00

0.14

0.10

0.12

0.06

0.02

0.39

P value

0.05

VI. LINEAR MCCALLUM RULES

As stated earlier the objective of this study is not just estimation of Taylor rule. Rather the objective is to find the monetary policy reaction function that closely approximates the behavior of central banker in Pakistan. For that purpose, different types of policy reaction functions are estimated; one of those is the McCallum rule in which monetary base is the monetary policy instrument which responds to deviation of nominal GDP growth rate from its long run average.

It can be seen from Table 7, column 2 (Rule 1) that monetary base negatively and significantly responds to nominal GDP growth rate. So central bank contracts money whenever inflation rate is high and/or business activity is in boom. Durbin-Watson statistics show that error term is serially uncorrelated so monetary authority does not seem to smooth monetary base. However, adjusted R-square is considerably low which show that monetary base is dependent on factors other than nominal GDP growth. Therefore, we have extended McCallum rule by incorporating lagged differenced exchange rate and lagged growth rate of monetary base. Results in the third column show that exchange rate is significant determinant of monetary base; currency depreciation leads to slowdown in monetary expansion. This result is consistent with the one found in Taylor rule that currency depreciation leads to monetary tightening through increase in interest rate.

Finally, results in the last column highlight the importance of inertia in monetary growth rate. It is found that once the monetary growth rate is higher due to whatever reason, the central bank tries to counter it by decreasing the rate of monetary expansion in the future. It is worth mentioning that adjusted R-square does not improve much even in this specification. Hence monetary base is dependent on factors other than nominal GDP growth rate and exchange rate. However, the low R-square is because the dependent variable is in differenced form. The LM stats show that there is no autocorrelation in the errors of this last specification.

TABLE 7

	Ru1e 1	Ru1e 2	Rule 3
Constant	0.13	0.14	0.19
	(0.00)	(0.00)	(0.00)
GDPG	-0.29	-0.38	-0.48
	(0.09)	(0.03)	(0.00)
D(ER(-1))		-0.01	-0.01
		(0.05)	(0.02)
MOYG			-0.43
			(0.00)
Adjusted R Square	0.03	0.07	0.24
DW Statistic	1.65	1.66	1.52
LM stats	10.14	11.66	4.32
	(0.04)	(0.02)	(0.28)

Linear McCallum Rule

GDPG is real GDP growth rate, D(ER(-1)) is lagged differenced exchange rate, M0YG is growth rate of monetary base.

VII. STABILITY OF PARAMETERS IN THE MCCALLUM RULE

As explained earlier policy reversal can be observed in the history of monetary policy in Pakistan. So we have found recursive estimates of the third specification of McCallum rule in which monetary growth rate depends on nominal GDP growth rate, exchange rate and lagged values of monetary growth rate. For this purpose, first sample is selected from 1993Q3 to 1997Q4 and then one observation is increased in each next sample. Estimates of parameters so obtained are then plotted which are shown in Figure 2.

It can be seen from results in the first panel of Figure 2 that the coefficient of nominal GDP growth rate is not stable over time. More

specifically this coefficient initially increases till 2002 and then it continuously decreases. Speed of decrease in the coefficient increases sharply at the end of 2008 and then after one year it became stable. This movement in the coefficient can be attributed to business cycle fluctuation, movement in the inflation rate and fluctuation in the monetary growth rate. For instance, inflation rate and monetary growth rate are negatively related with the coefficient of nominal GDP growth. Second panel of figure 2 show that coefficient of exchange rate in the McCallum rule is positively related to exchange rate. This coefficient increased in 1999, decreased in 2001 and again increased in 2009; exchange rate also moved in a similar way. The coefficient of lagged monetary growth rate remained almost stable throughout the sample period (Panel 3). However, this coefficient increased after 2001 due to monetary expansion.

Figure 2

Recursive Estimates of Parameters in the McCallum Rule



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VIII. NONLINEAR MCCALLUM RULE

We have estimated four specifications of McCallum rule. Two dummy variables are constructed for this purpose; first dummy variable has value 1 whenever nominal GDP growth rate was above its threshold and second dummy variable has value 1 when exchange rate was above threshold. These two dummy variables are then multiplied by nominal GDP growth rate and exchange rate. Again in these nonlinear McCallum rules Newey-West standard errors are used to find probability values.

In the first two specifications first dummy variable is multiplied by nominal GDP growth rate and exchange rate. Results in column 2 and 3

of table 8 show that the effects of nominal GDP growth rate and exchange rate on monetary growth rate are significant only when nominal GDP is above its threshold value i.e. there is boom in business activity and/or there is high inflationary regime. This result is opposite to conventional wisdom that government intervention through monetary policy is justified in recessions with low inflation and not in booms with high inflation rate11. Results in the last two columns of table 8 show that the negative response of monetary growth rate to nominal GDP growth rate and exchange rate is significant only when currency depreciates at higher rate (above threshold value). Results also show that adjusted R-square does not exceed 0.3 even in the nonlinear model.

TABLE 8	3
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	NGDPG Dummy		ER Dummy	
	Rule 1	Rule 2	Rule 1	Rule 2
Constant	0.19	0.20	0.19	0.20
	(0.00)	(0.00)	(0.00)	(0.00)
NGDPG		-0.58		-0.46
		(0.01)		(0.02)
D(ER(-1))	-0.02		-0.01	
	(0.00)		(0.00)	
M0G(-1)	-0.49	-0.45	-0.43	-0.43
	(0.07)	(0.12)	(0.12)	(0.13)
Dum*NGDPG	-0.88		-0.69	
	(0.00)		(0.00)	
(1-Dum)*NGDPG	0.10		-0.21	
	(0.91)		(0.43)	
Dum*D(ER(-1))		-0.02		-0.01
		(0.00)		(0.00)

Results of Nonlinear McCallum Rule

¹¹ For discussion on this issue see Scarth (1996), chapter 4.

	NGDPG Dummy		ER Dummy	
	Rule 1	Rule 2	Rule 1	Rule 2
(1-DUM)* D(ER(-1))		-0.00		-0.01
		(0.70)		(0.00)
Adjusted R-square R-square	0.30	0.24	0.26	0.24
DW Statistic	1.64	1.50	1.67	1.45
F stats	5.60	0.99	2.49	0.53
P value	0.02	0.32	0.12	0.47

NGDPG is nominal GDP growth rate, D(ER(-1)) is lagged differenced exchange rate, M0G(-1) is the lagged value of monetary growth rate. Dum, for columns 2 and 3, is dummy variable which has value 1 when nominal GDP growth rate is above threshold value and zero otherwise. Dum, for columns 4 and 5, is dummy variable which has value 1 when exchange rate is above threshold value and zero otherwise. Probability values are given in parentheses.

IX. INTEREST RATE DETERMINATION WITH BUDGET DEFICIT

Finally, we have estimated the equations in which interest rate is determined as a linear combination of target interest rate set by the SBP and the fiscal deficit. The first specification in this regard is the augmented version of the standard Taylor rule in which the short term interest rate responds to deviations of actual output from potential level, that of inflation from the target and logarithm of fiscal deficit.

Results in the second column of Table 1 (Rule 1) show that monetary authority in Pakistan does not follow Taylor rule. The coefficient of the output gap is negative and statistically significant. Moreover, the coefficient of the inflation rate, though statistically significant, is far below the benchmark value (1.5) and even does not satisfy the Taylor principle. The coefficient of fiscal deficit is positive, greater than 1, and is statistically significant. This shows that higher budget deficit leads to high interest rate which confirms that the effect of borrowing from commercial banks outweigh the effect of borrowing from central bank. However, the adjusted R-square is quite low which indicates the importance of factors, other than output gap, inflation rate, and fiscal deficit in determining the value of interest rate in Pakistan. Moreover, the Durbin-Watson is too low which might be an indication of the presence of autocorrelation. However, autocorrelation is not the only cause of low value of Durbin-Watson; there might be the problem of misspecified dynamics in the model. Hence, results of this specification might be misleading due to mis-specified dynamics and/or the presence of autocorrelated errors.

In rest of the three specifications the coefficient of output gap is significant and is positive. Moreover, the magnitude of this coefficient is quite high when it is adjusted for the long run. The coefficient of inflation in all specifications is positive and statistically significant. However, this coefficient has lower values and Taylor principle is not satisfied. It is found that SBP has strong preference of interest rate smoothing as the coefficient of lagged interest rate is very high and is statistically significant. Finally, the coefficient of differenced exchange rate is also positive and statistically significant indicating that the e exchange rate management is a policy objective of SBP. The coefficient of fiscal deficit is negative in last three specifications indicating that borrowing from SBP dilutes the monetary policy stance taken by SBP.

The equation of interest rate, when fiscal deficit is included, fits the data much better than different versions of Taylor rule without fiscal deficit. This shows that fiscal deficit plays important role in determining interest rate in Pakistan. So any attempt, at the part of monetary authority, to control prices or stabilize output will not prove fruitful unless fiscal discipline is maintained. This needs monetary and fiscal coordination, in the absence of which both policies may affect the target variables in opposite directions.

	Rule 1	Rule 2	Rule 3	Rule 4
Constant	-17.52	5.65	4.75	4.56
	(0.01)	(0.02)	(0.03)	(0.03)
Y	-0.31	0.16	0.18	0.14
	(0.06)	(0.00)	(0.00)	(0.01)

TABLE 9

Results of Interest Rate Equation with Fiscal Deficit

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	Rule 1	Rule 2	Rule 3	Rule 4
Inf	0.29	0.11	0.04	0.02
	(0.00)	(0.00)	(0.30)	(0.51)
i(-1)		0.99	0.98	1.24
		(0.00)	(0.00)	(0.00)
i(-2)				-0.26
				(0.06)
Log(FD)	1.89	-0.54	-0.42	-0.39
	(0.00)	(0.01)	(0.04)	(0.04)
d(er(-1))			0.25	0.23
			(0.02)	(0.02)
Adjusted R-square	0.55	0.97	0.97	0.97
DW Statistic	0.68	1.26	1.19	1.56
LM Statistic	19.09	6.87	8.69	6.36
	(0.00)	(0.14)	(0.07)	(0.17)

* y denotes output gap, inf denotes inflation rate i(-1) is lagged interest rate, and d(er(-1)) is the lagged differenced exchange rate. Log(FD) is the logarithm of fiscal deficit. Probability values are given in parentheses.

X. CONCLUSION AND POLICY RECOMMENDATIONS

The first objective of this paper is to estimate monetary policy reaction function. For this purpose, Taylor type rules and McCallum rules are estimated using quarterly data on Pakistan economy. Both types of rules have been modified by incorporating exchange rate management and interest rate smoothing as policy objectives. Moreover, the estimated values of parameters, in the rule, may not represent true behavior of monetary policy against all changes in the state of economy during the whole sample period, as the estimated values represent only average behavior. If different policy options are adopted in different conditions, with respect to business activity and inflation rate, then parameters of the rule do not remain stable over time. We have, therefore, found recursive
estimates of the parameters to sort out policy inconsistency. Finally, nonlinearity in the rules have been introduced with respect to the output gap and the inflation rate assuming monetary authority reacts differently, to the state of economy, above and below the threshold values of output gap and/or inflation rate.

SUMMARY OF FINDINGS

Results found in the study are summarized in the following.

- Monetary authority in Pakistan does not follow Taylor rule as the coefficient of output gap is negative and statistically insignificant and the coefficient of inflation rate, though statistically significant, is far below the benchmark value (1.5). Moreover, Taylor principle is not satisfied as the coefficient of inflation rate is also less than 1.
- There is strong preference of central bank towards exchange rate management and interest rate smoothing. Inertia in interest rate is found to be high and the result that interest rate positively responds to changes in exchange rate is robust to different specifications of the rule.
- Results of backward-looking Taylor rule are almost same as those found in case of forward-looking Taylor rule. The only difference is that the coefficient of inflation rate is statistically significant in forward-looking specification but not in the other one.
- Coefficient of output gap moves in opposite direction to business cycle movements: it is low during expansions and high in the slumps. Coefficient of inflation rate is high in low inflationary period but low in high inflationary regime. Coefficient of exchange rate and that of lagged interest rate are almost stable throughout the sample period but the former became low when currency depreciated at a higher speed, at the end of the sample period.
- Response coefficients do not vary much over the business cycle when positive output gap is defined as boom and negative as recession. However, the response to output gap varies at a threshold value of output gap, which is found 2.5%. The response

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of interest rate to output gap is positive only when output gap is below this threshold value. The coefficients of inflation rate and lagged interest rate do not vary across two regimes but the coefficient of exchange rate is positive only when output gap is below threshold value.

- Threshold rate of inflation is found about 6%. The coefficient of output gap is positive only in high inflationary regime while the coefficients of inflation rate and exchange rate are significant only in low inflationary regime. An interesting result is that Taylor principle is satisfied only in low inflationary regime and the response coefficient is close to zero when the inflation rate is above threshold. This result is consistent with Iftikhar (2012).
- Response of the interest rate to the output gap is significant only if lagged interest rate is above threshold (found 7.45%) but that to inflation rate is significant only when the lagged interest rate is below threshold. Moreover, monetary authority responds to currency depreciation more strongly when interest rate is low compared to that when it is high.
- The response of interest rate to the output gap is significant only if currency depreciation is below threshold (estimated at 0.68) while response to exchange rate is significant only if there is high speed of depreciation (above threshold).
- Fiscal deficit puts downward pressure on interest rate which is because a significant part of deficit is financed through borrowing from SBP.
- In the modified Taylor rule it is found that interest rate negatively responds to real GDP growth rate in static version while this response becomes insignificant in dynamic version of the rule. The modification in the rule does not alter the result that interest rate smoothing and exchange rate management are the two preferred objectives of SBP.
- Growth rate of monetary base negatively depends on the difference between nominal GDP growth rate and its average value indicating countercyclical response at the part of monetary authority. Moreover, growth rate of money is lowered by SBP

whenever local currency depreciates. Finally, monetary growth rate significantly depends on its previous values.

- Coefficients in the McCallum rule do not remain stable during the sample period. Coefficient of growth rate of nominal GDP is not constant, however, it is not clear whether this variation is because of change in the state of economic activity or is it because of change in inflationary regime. The coefficient of exchange rate is also not stable and co-varies with exchange rate. The inertia coefficient is stable over the sample period.
- The effect of nominal GDP growth rate and that of exchange rate on monetary growth rate are significant only when nominal GDP is above its threshold value i.e. there is boom in business activity and/or there is high inflationary regime. Moreover, the negative response of monetary growth rate to nominal GDP growth rate and to exchange rate is significant only when currency depreciates at higher rate (above threshold value).

POLICY RECOMMENDATIONS

Based on these findings this study makes some policy recommendations. Monetary authority should focus more on price stability and stabilization of economic activity and less on interest rate smoothing and exchange rate stability. Inclusion of lagged interest rate and currency depreciation in the reaction function is helpful in keeping financial sector and international trade stable. But stability of financial and external sectors is justified if it improves social welfare. Therefore, the interest rate smoothing and exchange rate management can be incorporated into the policy reaction function only if social welfare is not compromised.

SUGGESTIONS FOR FUTURE RESEARCH

More research is needed to find appropriate method of modeling nonlinearity. For instance, nonlinearity in the monetary policy reaction function can be modeled as Smooth Transition Regression (Teräsvirta 1994) in which switching from one monetary policy regime to the other is supposed to be gradual. Similarly, threshold regression models (Chan 1993; Hansen 1997) can be modified assuming switching from one regime to the other a discrete but Markov Process. Then the simulation

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analysis for nonlinear Taylor rules can be conducted with the appropriate form of nonlinearity regarding monetary policy reaction function.

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EFFECTS OF TRADE LIBERALIZATION ON TAX REVENUE IN PAKISTAN: AN EMPIRICAL SCRUTINY USING ARDL BOUND TESTING

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Abstract. This research paper examines the relationship between the trade openness and tax revenue collection alongwith other non-tax determinants affecting the tax revenue of Pakistan, by using time series data from 1980 to 2015. ARDL bound testing approach has been used to estimate co-integration. The results indicate that trade openness is inversely linked with tax revenue performance. If the trade openness is followed by reduction in tariff, then there may be a situation of reduction in tax revenue otherwise the outcome of trade openness might be different. For policy implication, the study suggests that government should give proper emphasis on the overhauling of the entire tax system for internal tax revenue mobilization in the context of uncertainty in foreign aid and acceptance of worldwide policy of free trade. Further, it should improve the property tax revenue collection in urban areas and also revamp the system of capital value tax on the immovable property transactions.

Keywords: Trade liberalization, Tax revenue, ARDL

JEL classification: F10, H27

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I. INTRODUCTION

Resource mobilization and development has been strongly focused by the policymakers for the last five decades or so. Underdeveloped countries are more concerned about the issue of resource mobilization for physical and human capital formation. Fiscal deficit arises as a result of a gap between the government receipts and expenditures. To bridge the fiscal gap, the state has to opt for internal or external borrowings which may have serious repercussions in the economy. The problems of fiscal deficit, high inflation, current account deficit in balance of payment are linked with the failure of tax structure in the country. When the government prefers internal borrowing for meeting the fiscal deficit, it leads to "crowding out" of private investment. The negative consequence of 'crowding out' effect of private investment means that investment in physical capital has reduced which ultimately retards the level of national output. Similarly, if the government relies on external borrowing for fiscal deficit, then it will lead to create the trade deficit at the end. In order to avoid these fall outs of fiscal disarray, it is necessary for the state to concentrate at the fullest level for mobilization of domestic resources.

The best indicator of the state performance is the level of tax effort by the government of a country as it measures the difference between the actual taxation and potential taxation. Bigger gap of tax effort reflects the failure of the state by challenging its legitimacy and authority because tax collection is a hidden eye to probe the state capacity for internal resource mobilization. Taxation is essential tool in the hand of government to achieve the goal of sustainable development. As Nicholas Kaldor (1963) stressed the role of taxation for development that an undeveloped country to transform itself into a developed country needs to increase its tax collection by 25-30 percent of GDP in place of 10-15 percent prevailing in developing economies. For the sustainable delivery of public goods and services, the government needs funds which may be ideally mobilized through taxation as the external funding is unpredictable and also tied with certain restrictions. In this article, an attempt has been made to investigate the factors which influence the tax revenue performance in Pakistan.

PROBLEM STATEMENT

Today the countries of the world are more concerned about the generation of domestic resources for the fulfillment of their needs. This essay focuses on the issues regarding the factors affecting the tax collection in Pakistan. A number of factors are included in the model to link the nature of relationship between tax collection and most importantly, the trade openness.

RESEARCH QUESTION

Has the trade openness negatively influenced the tax collection in Pakistan?

OBJECTIVE

To examine the long run relationship between the tax collection and trade openness in Pakistan.

HYPOTHESIS

HA: There exists a negative relationship between trade openness and tax revenue collection in Pakistan.

II. LITERATURE REVIEW

The factors affecting the tax revenue has been matter of long debate. A lot of empirical work has been done in this regard to investigate the nexus between a number of factors influencing the tax revenue collection significantly or otherwise. Researchers have studied this issue by including several variables in the regression model as independent variables by keeping the tax revenue GDP ratio as a dependent variable. Results and conclusions are quite different and sometimes contradict each other. The veracity in results may be due to diversified variables used in the data, countries chosen in the panel data, time period covered, and application of different research methodologies.

Chelliah, Baas and Kelly (1975) made a regression analysis for a group of 47 countries for the period 1969-1971. The results indicate a positive and significant relationship of tax GDP ratio with trade openness and share of mining in GDP. As expected, there has been a negative relationship of tax revenue with share of agriculture in GDP. Tait, Gratz

and Eichengreen (1979) uphold the same result for a group of 47 countries by taking the data from 1972 to 1976.

Ghura (1998) in his study revealed the positive link of tax revenue with trade openness, and per capita GDP but a negative one with agriculture GDP ratio and corruption indices.

Piancastelli (2001) investigated for 75 countries on the basis of data from 1985 to 1995. The study confirms that the per capita GDP, trade openness and share of industrial production are positively associated with tax revenue collection. On the contrary, the share of agriculture in GDP is negatively correlated with the tax revenue.

Teera (2003) investigated the linkage between tax revenue and several other variables on the basis of data for Uganda for 1970-2000. The results conclude that tax evasion, agriculture GDP ratio, and population density negatively influence the tax revenue collection. Surprisingly, per capita GDP also bears a negative sign. Whereas, trade openness evidences a negative sign but foreign aid documents a positive relationship with tax GDP ratio.

Eltony (2002) in his study took the data of 16 Arab countries for 1994-2000 to analyze the relationship of tax revenue with several other determinants. Two empirical models have been separately estimated for Arab countries and Non-oil Arab countries by using Hausman Test. For non-Oil Arab countries, the result suggests that the agriculture share in GDP is negatively correlated with tax ratio. While the other variables like share of mining in GDP, share of exports in GDP, share of imports in GDP, GDP per capita income and foreign debt GDP are positively related to tax ratio and are statistically significant. On the other hand, for Arab countries, the share of exports in GDP, mining share in GDP, and agriculture share in GDP are adversely associated with tax performance whereas import share in GDP and per capita GDP are positively linked with tax revenue collection.

Bird, *et al.* (2004) for the period from 1990 to 1999 for a group of 110 countries revealed the interesting relationship of tax revenue with several determinants. The empirical analysis reveals that the per capita GDP, and trade openness, index of civil liberties, political stability, and level of corruption are positively associated with the tax revenue collection. In the contrary, agriculture share in GDP, size of informal

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economy, literacy rate and inequality indices are negatively related with revenue performance. The study further added that the institutional quality also matters for achieving a high level of tax revenue collection. Lower level of tax collection has been attributed to poor quality of state institutions in Latin America.

Agbeyegbe, *et al.* (2004) based their study for 22 countries of the period 1980-1996. The results given by the study are that the variables like industrial share in GDP, agriculture share in GDP, per capita GDP, and trade openness are positively associated with the tax performance. But inflation rate is negatively correlated with the tax revenue. The positive sign of share of agriculture output in GDP is due to higher volume of exports of agriculture value added goods.

Ahsan and Wu (2005) identified the tax determinants affecting the tax revenue for a group of developed and developing countries for 1979-2002. Variables like agriculture GDP ratio, per capita GDP and population growth are negatively linked with tax GDP ratio whereas, trade openness has significant but positive relation with tax GDP ratio.

Lutfunnahar, (2007) undertook the regression analysis for Bangladesh with 10 other developing countries for 1990-2005. The study identified that trade openness, broad money GDP ratio, and foreign debt bear a significantly positive relation with tax GDP ratio. The coefficient of GDP per capita is negative which deviates from the normal perception.

Davoodi and Grigorian (2007) documented the link between tax revenue and various tax determinants which are in line with the earlier researches for a group of 141 countries for 1990-2004. The coefficients of institutional quality, per capita GDP, urbanization, trade openness and share of agriculture in GDP are found to be positively linked. Inflation and impact of shadow economy are negatively regressed with tax GDP ratio.

Gupta (2007) made an empirical study for 105 countries covering the period of 25 years and established a positive and statistically significant relationship of tax revenue with per capita GDP, foreign aid, trade openness and size of the economy. The study further finds that political stability, level of corruption, share of agriculture in GDP, and share of indirect taxes in overall tax collection have negative but statistically significant association with tax revenue collection. The study also investigates an interesting relationship between sources of tax revenue and the overall tax revenue collection and finds that more reliance on taxing goods and services leads to lowering the revenue collection. The study further extends its horizon by including an interesting notion that the relationship of tax revenue collection with other different variables also depends upon the prevailing stages of development of different countries in the panel data.

Mahdevi (2008) also contributed in the same subject matter by constructing a regression model for 43 countries covering the period from 1973 to 2002. The study reveals that the tax revenue performance is positively linked with trade openness, literacy rate, and per capita GDP and has negative association with inflation, foreign aid, and population density. Interestingly, share of agriculture in GDP, female labor employed, civil liberties, and economic volatility are found to statically insignificant.

Aizenman and Jinjarak (2009) investigated that the low income countries with poor quality of institutions experience a fall in their tax GDP ratio as a result of trade and financial openness. They further reveal that the association between trade openness and shadow economy is negative.

Profeta, and Scabrosetti (2010) developed the regression model for tax determinants based on 39 countries for 1990-2004. The study includes 11 Asian, 19 Latin American and 9 European countries for analyzing the results on the basis of regional disparities. Debt GDP ratio and per capita GDP are not statistically significant for Asian countries but positively associated in case of Latin American Countries. Trade openness is positively linked with tax revenue in case of countries from Asia and Europe but has negative effect for Latin American countries. Agriculture GDP ratio negatively influences the tax collection in case of Latin American countries but is not statistically significant for Asian countries. Similarly, literacy rate, ratio of female employed in the formal market, size of the informal sector of the economy, and ratio of working population over 65 years of age influence the tax performance significantly and positively in Latin American countries. Whereas, the results are quite different for Asian countries finding a negative

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relationship of employed population over 65 years of age with tax revenue and urbanization has no significant impact on tax revenue.

Pessino and Fenochietto (2010) present an empirical study for a group 96 countries for the period 1991-2006 to determine the correlation between tax revenue and other independent variables. The study upholds the previous results by endorsing a positive and significant relationship of tax revenue with per capita GDP, trade openness, and literacy level. While the variables like inflation, income distribution, and corruption indices have negative association with tax GDP ratio.

Antonio and Garcimartin (2011) investigated the relationship of tax revenue with various determinants for a group of developing and developed countries from 1990 to 2007. On the basis of empirical analysis, there find a positive and significant relationship of tax revenue with per capita GDP, and trade openness. While agriculture share in GDP and inflation show a significant but a positive relationship with tax GDP ratio contradicting the expected results. Income distribution is the most significant variable affecting the tax revenue.

Dioda (2012) made a study for 32 countries in Latin America and Caribbean for a period from 1999 to 2009 by segregating the determinants of taxation into three main categories *i.e* economic, political and socio-demographic ones. The regression analysis gives an important result that the share of agriculture in GDP is statistically significant but negatively associated with tax revenue. The impact of trade openness is positive on tax revenue. Similarly, the result also affirms a positive correlation of tax revenue with per capita GDP, female labor participation rate, literacy rate, population density, and share of people above the age of 65 years. Level of urbanization and population growth is not statistically significant having a small impact on tax revenue.

Karagoz (2013) constructed an econometric model for the period of 1970-2010 based on Turkey. The study estimated that the share of agriculture in GDP is negatively linked with tax revenue. Trade openness has no significant impact on revenue collection in Turkey. Foreign debt GDP ratio, share of industrial output in GDP, and urbanization are positively associated with tax revenue.

Castro and Ramirez (2014) developed an empirical model for 34 countries from OECD for the period from 2001 to 2011. The result show

that the per capita GDP, industrial growth and civil liberties have been positively linked with tax revenue collection whereas foreign direct investment and agriculture sector growth have adverse impact on the tax collection.

Velaj and Prendi (2014) investigated the relationship between the tax revenue collection and other variables including per capita GDP, unemployment rate, inflation rate and imports of goods and services based on data from 2001 to 2013 in case of Albania. The result indicates that the inflation rate, imports of goods and services, and per capita GDP have been positively linked with tax revenue collection. The unemployment rate has been negatively related to the tax revenue collection.

Jafri, *et al* (2015) investigated the relationship between trade liberalization and tax revenue collection in Pakistan based on data from 1982 to 2013. The results reveal that trade liberalization has been positively linked with tax revenue collection.

Cage and Gadenne (2016) investigated the relationship between tax revenue collection and trade liberalization with its impact on trade tax revenue for a group of 130 developed and developing countries of the world for the period ranging from 1792 to 2006. The results show that trade liberalization has more severe impacts on developing countries as compare to developed countries of the world and these are more longer lived in the former.

III. FISCAL IMPLICATIONS OF TRADE LIBERALIZATION

The affects of trade liberlaization on fiscal balance is a very crucial issue to consider, as most of the Underdeveloped have the budget deficit due to revenue constraint and rising trends in expenditures. The fiscal implications of trade liberalization are very sensitive debate especially in the context of underdeveloped countries and Rodrik (1998) regarded the fiscal severity created as a result of trade liberalization as a time bomb. The share of trade taxes to total taxes is significant one particularly in the case of underdeveloped countries of the world and the affect of trade openness on tax revenue mobilization are quite difficult to understand as it depends upon the mode of openness. Gupta (2007) and Keen and

Simone (2004) analyzed that trade openness adversely affects the tax revenue if it is followed by decreasing the tariffs. They further contributed that the trade liberalization positively affects the tariff revenue if there are reduction in non-tariff barriers like lifting the restriction of import quotas, rebates/concession, simplification of custom procedures, and lowering the tariff rates. Khattry & Rao (2002) made a cross-country evidence to analyze the impact of trade liberalization on tax revenue by taking the data of eighty countries on the basis of income classifications. They construct a regression model between the trade tax revneue and the degree of openness and other structural independent variables. The result indicates that the degree of openness is inversely related to tax revenue GDP ratio. A one percent decrease in the trade tax revnue leads to a 0.33 percent fall in tax revenue GDP ratio in all the groups of low income countries. They also point out that the independent structural variables have strong influence on the tax revenue GDP ratio particularly in the case of low income and lower middle income countries groups. Another study made by Khattry (2001) in which he discusses the relationship between the trade liberalization and the revenue squeeze in the context of impact on publc investment. He analyzes that the trade liberalization creates fiscal deficit and this fiscal deficit can be overcome by reducing the expenditures or by financing the deficit through internal or external borrowings and this will ultimately leads to increase in public debt. Incrase in public debt leads to an increase in expenditures on interest payments and therefore further increases the budget deficit. In this process, the government is trapped into a vicious circle of fiscal deficit. The relationship between trade openness and tax revenue GDP ratio has also been discussed by Baunsgaard and Keen (2005) by taking the data of 125 countries for the period of 1975- 2000. They conclude that the low income countries are unable to recover the lost revenue from trade liberalization efficiently. Low income countries only recover 30 cents against each dollar from the lost trade tariff revenue. The middle income countries have comparatively better recovery against the lost trade tax revenue. Their recovery is upto 45-60 cents for each dollar lost. In high income countries, the recovery is the highest one for one to one dollar.

In underdeveloped countries of the world, there has been a persistent reliance on indirect taxes as they are easy to collect especially custom duty and tariff. The government is more keen to levy indirect taxes to fullfil its budgetary target. In this scenario, if the government opts for trade liberalization policies following the path of lowering the tariff barriers will result into the shortfall in tax revenue. The government does not find a comfortable path to offset its revenue loss from other alternative sources. Therefore, the government has to rely on internal as well as external borrowings for reducing its budget deficit. More relying on borrowings may increase the burden of interest payments and the vicious circle of debt trap goes on. Cage and Gadenne (2012) made an empirical study on the same issue. They experienced that many developing countries suffered a tax revenues loss, therefore, trade liberalization may have come at a fiscal cost. Using a panel dataset of tax revenues and government expenditures in developing countries for the period 1945-2006, to consider whether countries are able to recover those lost revenues through othertax resources. The results show that trade taxes fall by 4 GDP percentage on average and less than half of the countries recover the lost tax revenues. Therefore, the fiscal cost of trade liberalization is more severe for countries as compared to developed countries of the world. Underdeveloped countries are more relied upon trade taxes due to easier mode of collection but when they have to forego trade taxes, they have been depreived of their major source of tax revenue. Then the countries have to opt for internal as well as external borrowings to compensate its revenue loss. This sort of remedial action creates more hardship for the government resulting into increased budget deficit. The budget deficit demands the government to reduce its development expenditures. In a nutshell, the fiscal cost of trade liberalization is the budget deficit.

In Pakistan, the trade taxes had been remained dominant among the other taxes during 70s and 80s but it had faced cut after the country followed the path of Structural Ajustment Program. In the pursuit of revamping the tax structure, the Federal Board of Revenue shifted the tilt from trade taxes to direct taxes especially the with-holding taxes. Despite of its all efforts, the government has not been able to make significant improvement in tax GDP ratio. From 2005-06 to 2015-16, the revenue from trade taxes has been decreaseed from 30% to 17% (as given in table below) reflecting the government failure to off set the loss it incurs from trade taxes.

TABLE 1

Total Tax Percentage of Tax Rev as Year Collection Trade taxes to % of GDP Total Tax Revenue Rs. bn 713.5 28.3 2005-06 9.4 2006-07 847.2 9.2 25.8 2007-08 1008.1 9.5 24.3 2008-09 1161.1 8.8 20.72009-10 1327.4 20 8.9 1558.2 2010-11 8.5 19.3 2011-12 1882.7 9.4 19 2012-13 1946.4 8.7 19.9 2013-14 2254.5 9 17.6 2014-15 2589.9 19.7 9.4 2015-16 17 3103.7 10.1

Fiscal Indicators as Percentage of GDP

Figure 1

Percentage of Trade Taxes to Total Tax Revenue



IV. DATA COLLECTION AND MODEL CONSTRUCTION

The objective of present study is to investigate the relationship between economic growth, trade openness, urbanization, foreign aid and tax revenues. World Development Indicators 2015 has been used to collect data on urbanization, trade openness (exports + imports). The data on real GDP, foreign aid and tax revenues from economic survey of Pakistan (various issues) have been obtained. The time span of our study is 1980 - 2015.

Following the above discussion in existing economic literature, the general form of our empirical model is given below:

$$TRY = f(LYPC, TRD, UPP, LPOP, NODAU)$$
(1)

where,

LYPC = Natural log of GDP per capita (constant 2004 US\$).

TRY= Real tax revenues % of GDP.

TRD= Real trade openness (exports + imports) Per Capita.

UPP =Urban population percentage of total population.

LPOP=Natural log of total population.

NODAU=Natural log of net official development assistance and official aid received constant at 2012 US \$.

JUSTIFICATION OF VARIABLES

• Per capita GDP is considered to be an ideal indicator for analyzing the overall economic development of a country and also positively associated with the tax revenue collection. As the per capita GDP increases, the share of tax revenue also enhances in the overall revenue collection. The positive correlation between per capita GDP and tax revenue has been further elaborated on the basis of Wagner's law which states that the demand for public goods and services is income-elastic. Income elastic demand for public goods and services signifies that the people demand for more goods as their income increases and this increased demand is financed through raising tax revenue. Lotz and Morss (1967), Chelliah (1971), Ghura (1998), Hinrichs (1966) and Tanzi (1992) have made the same observation that the development always facilitates the state to raise its tax revenue collection.

• The effect of trade openness on tax revenue mobilization are quite difficult to understand as it depends upon the mode of openness. Gupta (2007) and Keen and Simone (2004) analyzed that trade openness

adversely affects the tax revenue if it is followed by decreasing the tariffs. They further contributed that the trade liberalization positively affects the tariff revenue if there are reduction in non-tariff barriers like lifting the restriction of import quotas, rebates/concession, simplification of custom procedures, and lowering the tariff rates. Rodrik (1998) also extended a positive relationship between trade openness and tax revenue and stressed a broader role of the government in a more liberalized open trade environment. This conclusion has been replicated by Leuthold (1991), Ghura (1998), and Stotsky & WoldeMariam (1997). This finding has been further strengthened by the fact that imports and exports are easy to tax because their entry and exit are on some locations which are being monitored by the government.

• Foreign aid is also another significant determinant of tax revenue affecting the revenue performance. The relationship of foreign debt with tax revenue gives different results in various researches.

• Segment of aged population is another factor which may affect the tax performance of the state. As quantum of aged population increases, it puts more pressure on the state to create a sustainable system of taxation in order to establish a sound pension system for the wellbeing of aged population.

• Urbanization is considered to be positively linked with tax revenue collection. The increase in urbanization place more strains on the government to expand supply of public goods and services which needs to be financed through tax revenue.

V. EMPIRICAL RESULTS AND DISCUSSION

This section explores the relationship between economic growth, trade openness, urbanization, foreign aid and tax revenues over for the time period of 1980-2015. We find that our variables have unique order of integration and co-integration present among the series. Additionally, economic growth raises tax revenues but trade openness declines it. Urbanization is positively linked with tax revenues but foreign aid impedes tax collection in Pakistan. This study presents new insights to policy makers for designing an inclusive economic policy to sustain economic growth via transparent tax collection.

UNIT ROOT TESTS

When dealing with time series data it is necessary that its stationarity properties should be exploited. If stationarity properties are overlooked it can have important bearings on the estimation techniques. For instance, presence of non-stationary variables leads to spurious results which cannot be generalized in a useful manner. Therefore, two stationary tests namely: Augmented Dickey Fuller and Phillip Perron tests with constant and trend specifications have been applied to check the stationarity of variables. Both the tests produced mixed order of integration of the underlying variables in the model i.e. I (0) and I (1). To be specific TRY and LYPC are first difference stationary whereas TRD, NODAU, UPP and LPOP are level stationary.

TABLE	Ξ2
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	ADF a	ADF at level		PP at level		ADF at 1 st Difference		PP at 1 st Difference	
Variables	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend	
TRD	-2.9936 ^b	-3.2172°	-3.0794 ^b	-3.3344°	-	-	-	-	
NODAU	-4.1019 ^a	-4.3470 ^a	-4.1019 ^a	-4.2858ª	-	-	-	-	
TRY	-1.1091	-2.7282	-0.0958	-1.5719	-4.6397ª	-4.7343ª	-3.1668 ^b	-3.4200°	
LYPC	-1.3345	-2.3751	-1.9074	-2.3156	-3.9152ª	-4.0260 ^b	-3.8667ª	-3.9862 ^b	
UPP	-3.7351ª	-0.9614	-3.9803ª	0.1538	-	-	-	-	
LPOP	-10.8222ª	-1.0332	-10.6647ª	-1.0295	-	-	-	-	

Unit Root Tests

Source: Author's Estimation

AUTOREGRESSIVE DISTRIBUTED LAG BOUND TESTING PROCEDURE

There is wide range of co-integrating techniques available in economic literature to investigate long run relationship among variables of macroeconomic nature. In this analysis, ARDL technique of cointegration analysis has been employed due to its underlying advantages over other co-integration techniques. ARDL technique has advantage over other co-integrating techniques as it performs better in the sample of small size. Furthermore, this technique can be applied without any priori assumption regarding order of integration i.e. under this technique

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explanatory variables can be I (0), I (1) or mutually co-integrated. To investigate co-integration, ARDL testing procedure conducts a bounds test for the null hypothesis of no co-integration. The decision regarding presence of long run relationship among variables is made by comparing F-statistic with the critical values tabulated by Pesaran et al. (2001). If the value of F-statistics surpasses upper critical value, null hypothesis of no co-integration is rejected irrespective of whether variables are I (0) or I (1). Null hypothesis is accepted if F-statistic fails to exceed lower critical value. Results will be inconclusive if F-statistic falls between lower and upper critical values. If all variables are I (1), decision will be made on the basis of lower bounds.

The findings of ARDL bound testing procedure suggest the rejection of null hypothesis of no co-integration at 2.5% significance level when TRY is treated as the dependent variable. As it can be seen from the Table 4, the calculated F-statistic exceeds upper bound critical values at 2.5% level of significance suggesting the presence of long run relationship among variables when TRY is treated as dependent variable.

TABLE 3

Test Statistic	Value	K			
F-statistic	4.1065	5			
Critical Value Bounds					
Significance	I ₀ Bound	I ₁ Bound			
10%	2.08	3			
5%	2.39	3.38			
2.5%	2.7	3.73			
1%	3.06	4.15			

ARDL Bounds Test

Source: Author's Estimation

TABLE 4

ARDL Co-Integrating and Long Run Form

Variable	Coefficient	Standard Error	t-Statistics	p-value		
TRD	-0.1005	0.0458	-2.20	0.029		
LYPC	0.7313	0.3013	2.43	0.022		
UPP	0.9376	0.3976	2.36	0.026		
NODAU	-0.0384	0.0466	-0.82	0.417		
LPOP	0.5951	0.4842	1.23	0.229		
С	0.4168	0.2148	1.94	0.063		
Error Correction Term						
φ	-0.4817	0.1515	-3.18	0.004		
Short Run Dynamics						
D(TRD)	0.0999	0.0402	2.49	0.019		
D(LYPC)	-0.6635	0.3536	-1.88	0.071		
D(UPP)	1.1512	0.6103	1.89	0.070		
D(NODAU)	-0.0473	0.0305	-1.55	0.133		
D(LPOP)	-0.9053	0.7386	-1.23	0.231		

Source: Author's Estimation

Long run results are shown in Table 4. We find that income has positive impact on tax revenues and it is statistically significant at 1 percent level of significance. This indicates that 1 percent increase in per capita GDP is linked with 0.7313 percent increase in tax revenues, all else is same. This finding is consistent with the results of Srinivasan (2001), Mushtaq, Buksh and Hassan (2012). Trade openness is inversely related with tax revenues and statistically significant at 5 percent. Keeping other things constant, a 0.1005 percent decrease in tax revenue is linked with 1 percent increase in trade openness. The said finding has been the same as given by the results of Khattry (2001), Khattry (2002), and Keen &Bansguard (2005). The relationship between urbanization and tax revenues is positive at 1 percent level of significance. It reveals that 1 percent increase in urbanization increases tax collection by 0.9376 percent if other things remain constant as showed by Longoni (2009).

The foreign aid affects tax revenues negatively and it is statistically significant. We find that a 1 percent increase in foreign aid decreases tax collection by 0.0384 percent by keeping other things constant as parallel studies found a negative impact of aid on tax revenues (Gupta, Clements, Pivovarsky & Tiongson, 2003; Khan & Hoshino, 1992), but more recent works are Bräutigam and Knack (2004), aid reduces tax revenue in the recipient country. Similarly, the relationship between population growth and tax revenue collection finds to be positive. This has been validated by the facts as mentioned in Economic Survey of Pakistan 2015-16 that 60.4 percent of population is between the ages of 15 to 64 years in comparison to dependent population of children under the age of 15 years is 35.4 percent whereas 4.2 percent people are above 65 years. Therefore, main segment of the population has been contributing in the economic activity.

DIAGONISTIC TESTS

When estimating regression equation, it is better not to overlook its major issues like Serial correlation, Heteroskedasticity, Normality and Specification bias. If these issues are present in estimated model, then there is danger of getting potentially biased results which will not be reliable. Therefore, different tests namely: Ramsay RESET Test for Functional Form, Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Heteroskedasticity Test and Normality Jarque-Bera Test have been employed to check for the possible diseases which may render results unreliable. The insignificance of all the tests except Ramsay RESET Test suggest that the model under consideration is free from serial correlation, heteroskedasticity, and residuals are normally distributed as well. Whereas, significance of RESET Test at 5% level of significance indicate the presence of specification bias.

	Value	df	Probability			
t-statistic	2.2491	27	0.0329			
F-statistic	5.0584	(1, 27)	0.0329			
Breusch-Godfrey Serial Correlation LM Test						
F-statistics	0.1833	(2, 26)	0.8336			

 TABLE 5

 Diagnostic Tests (Ramsay RESET Test for Functional Form)

	Value	df	Probability			
Chi Square(2)		2	0.7840			
Heteroskedasticity Test: Breusch-Pagan-Godfrey						
F-statistics	0.7051	(6, 28)	0.6480			
Normality Jarque-Bera Statistic						
Jarque-Bera	1.9407	-	0.3790			

Source: Author's Estimation

PARAMETER STABILITY TESTS

The presence of long run relationship among variables does not ensure stability of parameters. If the parameters are not stable, there is a danger of getting potentially biased results. Therefore, to check for the long run stability of coefficients, cumulative sum of recursive residuals (CUSUM) and the CUSUM of squared residuals (CUSUMSQ) tests proposed by Pesaran (2001) are employed. The underlying advantage of these tests is that do not require any priori information regarding structural break point. The null hypothesis is that all parameters are stable.

CUSUM test is based on cumulative sum of recursive residuals which utilizes first observations that are updated recursively and plotted against break point. Such a mechanism makes this test suitable for detecting systematic changes in the coefficients. Whereas, CUSUMSQ test is based on squared recursive residuals which makes this test conducive for situations where the departure from constancy of coefficients is haphazard and abrupt. The decision regarding whether parameters are stable or not is based on the plots of CUSUM and CUSUMSQ. If the plot of CUSUM and CUSUMSQ lie within 5% critical bound, parameters are regarded stable which means null hypothesis is not rejected. Conversely, if either of parallel lines of critical bounds are crossed, then parameters are regarded unstable which means null hypothesis is rejected.

As it can be visualized from the figures, both the CUSUM and CUSUMSQ plots stay within the 5% critical bound, thus indicating that the coefficients in the model do not suffer from any structural instability during the period of study.



FIGURE 2

V. CONCLUSION AND POLICY IMPLICATIONS

This section determines the contributing factors i.e. economic growth, trade openness, urbanization, foreign aid population growth and tax revenues in case of Pakistan. The time span of study is 1980-2015. We have applied Ramsay Reset test for functional form, Bresuch-Godfrey Serial correlation LM Test, Bresuch Pagan Godfrey Hetroskedasticity Test and Normality JarqueBera Test to find the integrating properties of

the variables. The presence of co-integration is tested by applying the ARDL bounds testing approach to co-integration in the presence of structural break arising in the variables. Our empirical evidence validates the existence of co-integration over the period of 1972-2015. Economic growth enhances tax collection. Trade openness is inversely linked with tax revenues. Urbanization raises tax collection. Another important result is the negative relationship between foreign aid and trade openness. More the reliance on foreign aid, higher will be the volume of interest payment which further squeeze the government's capability to reduce the budget deficit. The relationship between the population growth and tax revenue collection has been positive marking the potential available human capital as the 60 percent of the population lies in the age bracket of 15 to 64 years of age.

Our results suggest several policy recommendations. Negative impact of trade openness and foreign aid on tax revenue performance recommends that the government in Pakistan has to take several policy measures for overhauling the tax structure which emphasis more on reducing tax expenditure, minimizing tax evasion, expanding narrow tax base and curtailing the size of informal sector of the economy. To tackle the problem of revenue shortfall due to trade openness, the solution is of two tiers. Firstly, the government has to make full efforts for maximizing the revenue from custom tariff. Secondly there is need to eliminate the distortions in domestic tax system which retard the process of revenue generation.

For enhancing the tax base, it is imperative on the part of the government to reduce horizontal inequities arising as a result of large number of tax exemptions and concessions. Large tax exemptions clearly indicate that all the growing sectors of the economy do not contribute into the tax effort in accordance to their share in GDP. For that purpose, it is substantial to increase the share of those sectors in federal taxes which are lightly taxed or fully untaxed by a long list of exemptions like agriculture, services and capital gain. Main focus should be given to those subsectors whose tax contribution is far less than their GDP share *e.g.* textile, transport and communication, food and beverages, whole sale and retailer, telecom and other services. For broadening the tax base, the practice of dependence on few revenue spinners should be brought to an end because 70% of revenue collection from GST comes from only top 5

import items. Sales tax and excise duties have been underperformed due to special tax regimes and zero-rating, these preferential treatments should be reviewed. In order to control the misuse of tax credits, exemptions, zero-rating and other preferential treatments, audit of the business affairs of the taxpayer and enforcement of tax laws are imperatives for increasing the tax effort. Moreover, government should give more stress for switching from 'easy to tax' to 'hard to tax' *i.e* from indirect tax to direct tax. Tax expenditures should be reduced because these are the root cause of narrow tax base and creating various distortions in the economy. The benefits of tax exemptions are restricted to a specific interest group whereas its cost bears by the whole economy. Therefore, the process of granting the status of preferential treatment to selected taxpayers demand a cautious scrutiny of the taxpayer and its repercussions.

Pakistan needs a continuing effort for taking measures to off-set the revenue loss due to tariff reduction. The first and foremost measure which the government requires to take is to eliminate the tariff exemptions in order to lessen the heavy bulk of tax expenditures. The government should adopt a uniform tariff policy which would facilitate to remove the differentials in protection rates, minimize the scope of pressure groups pursuing for special preferential treatment, also play down the discretionary powers of the custom administration to misclassify the imports at the time of border entry, and also helps to simplify the custom procedures. One of the studies estimated that by eliminating all exemptions, and adopting a uniform tariff of 10% help to increase the tariff revenue by 79% and total import tax revenue by 36% in Pakistan (Reis & Taglioni 2013).

The positive relationship between urbanization and tax revenue performance give further insight to improve the property tax resource mobilization in urban areas in the light of spiky acceleration in the capital and rental values of the urban immovable properties. The government can get a substantial amount of revenue by revamping the entire system of taxation dealing with urban immovable properties. The government should withdraw its un-necessary exemptions given to different class of persons. The government should avoid the practice of rate differentials and underassessment of urban properties by strict employing strict nondiscriminatory enforcement policy.

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IMPACT OF TELECOMMUTING ON THE FINANCIAL AND SOCIAL LIFE OF TELECOMMUTERS IN PAKISTAN

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Abstract. The present research aims to explore the current usage, possible benefits and impact of telecommuting along with the hindrances in development of this phenomenon in Pakistan. Financial and social impact of telecommuting was also determined on telecommuters. This study utilizes structured interview technique. By using judgmental sampling method, data was collected from specified sample of 54 telecommuters from Lahore. It was interesting to know that people who were involved in telecommuting reported the unfamiliarity with the term. Based on findings, the study concludes that telecommuting is a latest and valuable business tool that provides comfortable working environment along with the financial benefits to the users but due to lack of awareness, it is not being used extensively in the country. Respondents also gave recommendations including training of employees, making them computer literate, develop infrastructure and create awareness about telecommuting to make its future promising.

Keywords: Telecommuting, Technology Innovation, Social and Economic Impact, Pakistan

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I. INTRODUCTION

Durkhiem (1984) in his famous research work "The Division of Labor in the Society" described the transition process of primitive societies to the industrial and economically advanced societies. Durkhiem suggested, "progress of a society generally starts with a simplest level and then develop into a more complex stage". The author emphasized "the main conversion of the ancient social order into an advanced and industrial society could otherwise bring disorder or crises". Therefore, modern sociology developed in response to the crisis linked with modernity, for instance, industrialization and procedure of rationalization. But modern day technology is striving actually to make life simpler though technological advancements have revolutionized each and every field of society. This is another prospect of emerging technologies that it has even made possible today to work everywhere and in any environment. Telecommuting is such a technology which has transformed the concept of physical presence of employee at office to what he/she can deliver from home. Telecommunication technologies facilitate an individual to work outside the conventional workplace or office, for example, from remote location, generally from home, or in a mobile situation. etc. Telecommuting is described "telework, electronic homework, the electronic cottage, networking, distance work, location independent work and flexi place" (Huws, Morrison, and Saveri, 1991).

Brown (2010) expressed that "Telecommuting is a significant workplace innovation that allows an increasing portion of the work force to work from home or work at a location remote from the central workplace at least one-day a week". Since long, the developed economies telecommuting effectively because have employed they are technologically strengthened. Pakistan is so far a less developed and technologically poor country. Internet coverage in Pakistan is limited. Even most of the urban areas of Pakistan are still without internet. There is no doubt that teledensity in Pakistan has improved but still a far away from being sufficient. Exceptions aside, Pakistan has not embraced by information technology (IT) yet consequently nothing can be found physically or in the form of revenue. Pakistani industry of information technology is at its initial stage and what it has been accomplished until now is inadequate. Furthermore, "latest and existing technology is not used properly yet due to the lack of standard and practiced culture of the

business that requires proper planning based on strategic thinking. These are the inimical factors for the long-term and in time investment of resources required for the field of IT to develop and deliver" (Shirazi, 2011).

Earlier research studies (Bélanger, 1999; Pinsonneault & Boisvert, 2001; Potter, 2003) depicted "main reason of the expansion of this notion is found in its professed advantages for both the telecommuters and their employer including job satisfaction, enhanced productivity, increased flexibility, belonging and loyalty to the organization, saving of the office space, better employee's morale, retention and attraction". Present study is concerned with exploring the usage of telecommuting in Pakistan where there are many hindrances in its practice particularly limited technological advancements along with the acceptability by the traditional society are among the most common problems. Moreover, the research investigates the impact of telecommuting on the economic and social life of telecommuters along with the future of this profession in Pakistan. Thus, objective of the study are three folds:

- To explore the usage of telecommuting in Pakistan;
- An attempt to comprehend the impact of telecommuting on social and financial aspects of its users' life;
- To assess the prospects of telecommuting in the country.

II. CONCEPTUAL BACKGROUND

Numerous research studies have been carried out in the sector of telecommuting and questioned many issues in developed countries, for instance, United Kingdom and United States from where this concept emerged. Dudman (2001) reported that between 1997 and 1999, three hundred thousand citizens were engaged in telecommuting (work from home) in the UK however in 2000 there were nearly 1.5 million people and several multinational companies embraced with telecommuting including Young, Ernst & IBM etc. Current study has its own significance as it explores the contemporary and potential prospects of telecommuting in the country. It was also imperative to identify the measures which can be useful to raise the usage of telecommuting in Pakistan and can approach the developed nations' economy levels.
Moreover, it would be supportive for entrepreneurs and market runners in getting benefits through telecommuting, later, are helpful to improve the Pakistan's economy.

Dieringer Research Group (2006) wrapped up in their research study that telecommuting has become popular among several United States employees as they have realized and enjoying the cost benefits which a offers. telecommuting program The study established that "Telecommunication industry in America has made great progress and labor force in telecommuting has been increased to 20 per cent, i.e. increased from 26.1 million in 2005 to 28.7 million in 2006". The study concludes that "the access to wireless and broadband connections has made telecommuting low cost and more productive to work remotely. Thus number of employees is increasing who are using alternative work programs, designed to support them in accepting a balanced lifestyle". The study in 2006 predicted the chances of a boost in telecommuting industry and estimated 100 million workers by 2010.

Mokhtarian and Handy (1993) established that "the awareness of telecommuting is increasing amongst the users including employees or workers, communities, telecommunication industries, transportation planners, and others however the real levels of telecommuting appear to be modifying gradually although a little genuine data on the development is available". In addition, the research demonstrated "the future of telecommuting or on workers if they take full benefits of this prospect, then lastly on the government if it encourages the both policies of employers and worker". The study raised several questions about progress of telecommuting over time, but concluded that predominantly the future of telecommuting seems assuring and promising".

The findings of the research survey conducted in 2011 in US showed that "telecommuters are satisfied with telecommuting that they would rather sacrifice their favorite television programs (54 per cent), nap of an hour (48 per cent), favorite food (40 per cent) or even a part of their wage (40 per cent) than giving up telecommuting" (Lesonky, 2011). 80 per cent telecommuters say, "work from home make them feel healthier and relieved. Thus they can work more professionally and productively leading towards better professional -life stability". Owners who are

running big business prefer telecommuting and maximum 76 per cent of them show loyalty to their work and prefer overtime. The research also exposed "telecommuters are relaxed employees in comparison to the nontelecommuters". The findings also lead the research to investigate the economic and social levels of contentment of telecommuters with their work in Pakistan.

Gajendran and Harrison (2007) conducted a study by involving twelve thousand eight hundred and eighty-three (12,883) employees and 46 studies meta-analysis confirmed that "telecommuting had no general injurious effects on the quality of workplace relationships". Further, "telecommuting significantly had little but primarily advantageous impressions on proximal outcomes, such as perceived autonomy and (lower) work-family contravene". Results of the study also illustrated that "telecommuting had beneficial effects on more lateral results such as functioning, job pleasure, performance, turnover purposes and the role stress". The beneficial appears partially arbitrates by autonomy. Adding to it, high-intensity telecommuting (more than two days in a week) stressed on telecommuting's benefit on work-family disparity but upsets relationship with colleagues.

Zelinsky (1994) says "workers get more work done if out of the former office. The increase in productivity is the most significant benefit of telecommuting when a worker turns into a telecommuter, expressed by steelworkers and their managers, in an AT&T-sponsored survey of 'Fortune' 1000 managers, 58 per cent pointed out increased in worker productivity". Further, "The State of California's Telecommuting Pilot Program experienced efficiency growth from 10 per cent to 30 per cent and Blue Cross telecommuters apparently improved their productivity by 50 per cent, Pacific Bell by 57 per cent, J.C. Penney by 25 per cent, and The Travelers by 33 per cent". AT&T's group of 6,000 sales workers' reported a rise in productivity to 45 per cent when they were working from home or from offices of their clients'.

A research conducted by Cooper and Kurland (2002) employed Grounded Theory Method and compared the telecommuting impact on private and public workers' perception regarding professional isolation. The study interviewed 93 telecommuters and non-telecommuters along with the supervisors in two renowned technology firms and two of the city governments, who were running dynamic telecommuting programs and concerned to make telecommuting a successful work choice. Furthermore, these associations intend to provide the opening of inquiring challenge that exists in environment even that is encouraging for telecommuting business. Professional isolation of telecommuters was allied with the development activities of employee including instructing; intimate learning; social networking, etc. evidenced the interviewers. "The degree to which the activities are appraised in these organizations and the extent to which telecommuters fail to make use of these opportunities lead towards the magnitude of telecommuters facing professional isolation" (Cooper & Kurland, 2002). It seems that public workers value less to these not-so-formal activities of development as compared to private workers. Therefore, it can be said that telecommuting, probably, obstructs the professional growth of workers in public sector less as compared to employees of private sphere.

A research study by Heibel (2007) confirmed that in US Federal Government is supporting telework plans. After realizing the advantages of telecommuting, "Federal Transportation Appropriations Bill" was approved under which the federal agencies were required to allow all the telecommuters to perform telework. The congress made sure the promotion of telework projects of environmental potentials and energy along with provision of capacity to stay operational particularly during huge emergencies. The Georgia's clean 'Air Tele-work Campaign' is one of the good examples that focused on improvisation of quality of air and decrease of metro cities' traffic burden. Said program presented benefits to a number of the local/home companies, for instance, tax credits, grants, aids and other encouraging material to support them in developing their programs of timework.

The findings of research by Oliver (1994) declares "companies that apply telecommuting and using teleworkers can continue working professionally and efficiently whenever any tragedy related to weather hit the country". It further revealed that "the wake of the September 11 terrorist attacks, thousands of workers resettled in New York metropolitan areas and Washington DC were telecommuting".

In another research study titled "telework programs and their benefits" conducted by Telework Research Network established that "business organizations can facilitate their employees by saving more than a million \$ per annum for their company and \$ 6, 800 to the workforce if they permit only hundred of their employees to work partially from home and partly from office". Telework Research Network studied about 250 case studies and research papers along with supplementary telecommuting documents, based on related researchers and companies' interviews established "80 percent of the workers wanted to telecommute and 30 per cent would like to take a pay cut in order to telecommute, less than 2 per cent of the employees for the majority of their time, worked from home and at least 40 per cent had jobs that were well-suited with telecommuting".

After reviewing the above and other related literature, following are the research questions drawn for the scenario of telecommuting in Pakistan.

- 1. Is telecommuting practiced in Pakistan?
- 2. Is there any impact of telecommuting on social activities of the telecommuters?
- 3. Does telecommuting have any effect on the financial condition of its users?
- 4. Does telecommuting have bright future in the country?

III. METHODOLOGY

This is a qualitative research study and used descriptive approach to present the results. Intensive interviews research method was used for data collection. In-depth or intensive interview approach is basically a one-on-one personal interview. Generally speaking, In-depth interview uses small sample and collects detailed and extensive information that why the respondents give particular answers. The research applied structured, telephonic and personal interviews, after preparing checklist and all the respondents were asked same questions. Total 54 telecommuters were sampled for interview from the population through judgmental sampling technique from city of Lahore, Pakistan. The study specifically chooses respondents of the telecommuting field since this concept has introduced in Pakistan. Since present study is the pioneer research and conducted at the initial stages of the telecommuting in Pakistan so did not stipulate the age limit, qualification and gender of the sample. Therefore, both males and females of varied age groups (25 to 35 years) and qualifications (graduation to post graduation) were included in sample. The major concern of this research study was to investigate the usage of telecommuting and its impact on the life of telecommuters, its acceptance along with hindrances in the progression of this concept by the traditional society of Pakistan, thus variation of age, gender and qualification in the selected sample didn't make any difference. Total male respondents were 44 and females were 10 only.

IV. FINDINGS AND DISCUSSION

As judgmental sampling technique was used to draw sample for the study only from Lahore and as a result total 54 respondents were interviewed. The study recorded demography of respondents and focused on age, gender, education, income, marital status etc.

TABLE 1

Gender		Age		Qualification		Marital Status		Income (Rs)	
Male	Female	25-30	31-35	Graduate	Post Graduate	Married	Un-Married	25-50000	5000 plus
44	10	30	24	39	15	28	26	32	22
81.5	18.5	55.5	44.5	72	28	52	48	59.3	40.7

Demography Characteristics of Respondents (in percentage)

Table 1 illustrated that the majority respondents belonged to the age between 25 to 30 years (55.5 percent). Sample included 81.48 per cent of male respondents while 18.52 per cent women. It showed that telecommuting is being accepted by both gender (men and women) in Pakistani society. According to the data it can be said that telecommuting, a professional technique is beneficial and in use of both the gender. Majority respondents were graduate and married. Most of

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them were earning 25000 to 50,000 per month and also reported that they are involved in telecommuting for the last eight years.

In a response to question do general public are aware of telecommuting in Pakistan, it was interesting to know that people who were involved in telecommuting they also reported the unfamiliarity with the term. While only four of the respondents said they were aware of the term and the concept. Though the sample is small to be generalized to the whole country and the research is qualitative in nature but it can be said from the responses that telecommuting has been introduced in Pakistan but still not adopted by Pakistani's at a large scale. Exceptions aside, the technique of telecommuting is not selected as a conventional phenomenon which can be beneficial for both public and corporate sector of Pakistan.

Respondents were informed that telecommuting is "use of telecommunication technologies that allow an individual to work outside the traditional office or workplace form a remote location; generally, from home or it can be a mobile situation which they were already doing". Afterword the respondents were asked about the professions which are most conducive for telecommuting, majority respondents answered that information technology (IT) is the most favorable field of telecommuting. Use of telecommuting can make our country technologically rich which in turn will pave a way to new businesses based on telecommuting industry. Some of the respondents replied that writing blog is the encouraging method of introducing telecommuting at international level therefore bloggers are being appointed and heavily paid for writing and managing blogs whereas few of the respondents also mentioned that web designing is also favorable in this regards. Therefore, telecommuting is considered as the most useful method, more or less, for all kinds of programming of sales, consultancies and assistance which is virtual in nature and thus will mainly depend on computer literacy and sound IT infrastructure.

Job satisfaction is an important component for every worker, whether telecommuter or non-telecommuter. While reporting the satisfaction towards job and life, most of the male and all of the female respondents stated that the flexibility in working hours and place was a huge motivation to adopt this modern technology based technique. Telecommuters were found to be more satisfied with their profession because of flexible nature of the job. They have stress free life, without being bound to organizational routines.

While answering to the personal questions about the impact of telecommuting on the social lives of respondents, responses were dichotomous accounting both negative and positive effects. One of the significant benefits, majority telecommuters mentioned, they are allowed to work from home instead of traditional office settings and fix working hours. They are satisfied and motivated to work due to flexible working hours, comfortable locations with no urgent meetings and calls to attend. Telecommuters enjoy the freedom to balance work and home affairs, for instance, everyday chores, child care, shopping, managing private matters, hobbies, social activities, participating in events, spending time with family and friends, etc. Majority respondents were on the opinion that now they have a better social life. A study conducted by Hunton (2005) also found the similar results. It describes that "in a telecommuting setting, the typical work day, is not a norm now. Instead, tele-workers are free to balance between the work and personal activities. In addition, telecommuters are more motivated to work, as they enjoy job satisfaction".

They reported no stress of taking leaves from office but one fourth of the respondents expressed the reservations of becoming less social and isolated being all the time with computers and internet. They stated that a company that relies on sturdy team collaboration during completion of a project, telecommuting can be tough job if the team was not supportive. They further said "particularly if the staff communicates online only or through phone, certainly they face hard time in maintaining and building relations with colleagues, which can damage the productivity and job satisfaction". They also expressed that "relationship generally leads to trust and valuable collaboration; telecommuting can deteriorate the environment".

On the other hand majority while responding to importance of team relationship said "to maintain the staff connectivity, meetings, retreats or social events required to be planed and efforts should be put for in-person attendance. If manageable, all the staff members required to be present in the office at least for one or two days weekly to retain regular contact". Some of the respondents stated that they experience some conflict with family members also when they work from home. However, Hunton (2005) exposed that "telecommuters face higher rates of conflict among family and friends, when compared to traditional workers. The problem could be attributed, perhaps, to the amount of time spent with family and friends".

Responses for assessing the financial impact of telecommuting on its user brought up some very interesting answers. Majority of the respondents accounted more money in lesser time as an excellent advantage, these responses were expected but seven of the respondents cited saving fuel also because they do not have to travel for their work. Hunton (2005) also have the same conclusion that "one of the advantages of telecommuting is that workers are saving the cost and time of travel they take to back and forth". In a country like Pakistan where petrol and CNG shortages are routine matter, telecommuting seems to be heavily advantageous. Harpaz (2002) also stated that "one of the telecommuting benefits is that it reduces the quantity of fuel used, since fewer motor vehicles are moving on the road. Some of the other benefits to the society include a reduced pressure on system of transportation, pollution in the environment and added opportunity for handicapped employees". Money saving, no time limits and gaining work experience for national and international multinational companies are also brought up by half of the interviewee in answer to this question.

Other telecommuting benefits, majority pointed out were "it saves the money of company to build the infrastructure, but the organization requires investing in infrastructure for network, hardware of informational technology and software at the main office and workers' locations". However, a research study by Topi (2004) reported a disadvantage of telecommuting "such organizations supposed to develop policies for protection of themselves and their resources".

During the interview the majority also said that telecommuting is not only beneficial for individuals but can also have positive impact on business and economy of the country thus a bright future can be anticipated. Most of the respondents were of the view that a strong relation between telecommuting and economy of a country may exist and if telecommuting employed as business model it would be very productive for economy. All of the interviewees listed increase in the employment rate as a significant benefit of telecommuting. They stated that telecommuting offers multitude of opportunities to work. In order to get benefit from these various opportunities people try to be more efficient. Thus, telecommuting is generating efficient manpower. Further revenue generation and business expansion were the benefits mentioned by nearly all of the respondents.

It can easily be stated that telecommuting can be an effective tool for the improvement in financial conditions of individuals who are using along with a positive impact on the economy of a country. It can also be fruitful for the whole organizations if they employ it in their business model. They can earn maximum profit by employing manpower with more experience yet affordable to them. Their businesses can progress and develop which ultimately have very positive implication on the overall economy of the country.

On the basis of data, it can be said that future prospects of telecommuting in Pakistan seem promising. Respondents also gave recommendations to make telecommuting workable and successful in Pakistan. They were of the view that by creating awareness, enhancing computer literacy, establishing sound IT infrastructure and above all through training or capacity building of employees telecommuting can be promoted. Moreover, government needs to take initiative by providing facilities and hiring telecommuters to encourage this field.

V. CONCLUSION AND RECOMMENDATIONS

The data of this study reveals that in Pakistan telecommuting is a newly emerged phenomenon and majority Pakistanis is not familiar with the concept. Although telecommuting became a viable option with the advent of email and Internet technology in both big corporations and small businesses but this research study confirmed that the practice is increasing with very slow speed. However, with the introduction of telecommuting based channels/companies, the acceptance level would rise since it offers relieved working from home without any stress of leaving out for work place and managing organizational commitments.

This model of working is not creating any bad impact on social life of the workers rather supportive in improving their financial conditions and savings. Furthermore, telecommuting establishes that it can also be supportive in economic development of the country because it enhances employment opportunities, with more competent workforce along with the comfortable environment there will be more productivity thus more revenue generation. On the other hand, telecommuting may result in social isolation for some of the telecommuters in absence of companies' responsibilities, working environment of the office and interaction with colleagues; however, for several it seems a blessing because they can spend desirable time with their family members without any work stress. Telecommuting is a good choice for self-directed employees who can perform much of their work without face-to-face interaction on a day-today basis. Writers and computer programmers are examples. It is not a good choice for positions in which unscheduled meetings are frequently needed. It is also inappropriate when an employee needs access to equipment and data that can only be found on site. Managers and supervisors may find telecommuting to be a challenge, especially when the team they oversee has not yet coalesced or is experiencing conflict. Although some positions may suit a full-time telecommuting schedule, a company may also offer the option of telecommuting once a week or even once a month.

The study also concludes that the leading impediment for the growth of this phenomenon (telecommuting) in Pakistan is the lack of usage of technology. Therefore, the study suggested to the government to take initiative for promotion of telecommuting and introduce telecommuters in corporate sector. If the availability of required and adequate technology for the support of telecommuting is ensured along with literate and skilled manpower, telecommuting appears to be successful and would contribute towards the economy of the country.

It is also recommended that more research is needed to explore the phenomena of telecommuting in the country. Particularly the long term effects of telecommuting on organizations, individuals, and society required to be investigated in future.

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CONVERGENCE HYPOTHESIS: A CROSS COUNTRY ANALYSIS

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Abstract. Convergence debate has been an important topic of economic growth literature. This article aims to investigate convergence at assorted level of disaggregation among a sample of almost 60 countries. It has tested absolute and conditional convergence hypotheses for a set of developed and developing countries by applying pooled least square methodology. The results suggest absolute convergence for countries having similar characteristics and conditional convergence for countries having heterogeneous structures. Disparity level for each country is also calculated with reference to average steady state income. The study has also scrutinized the role of investment, openness and population growth in accelerating the convergence process.

Keywords: Absolute convergence, Conditional convergence, Solow swan growth model, Pooled ordinary least square

JEL classification: C23, F43, C61, O16

I. INTRODUCTION

There has been substantial inquisition into the nature and sources of differences in growth rates across countries and regions over time. This

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was essentially necessitated owing to the considerable potential impact caused by even marginal differences in growth rates, over a long period of time, on the standards of living of people. Convergence, as a phenomenon of diminution in growth rate disparity among different regions, denotes the course by which comparatively poorer regions or countries grow quicker than the rich countries. It can be described as a process of catching up or narrowing down the gap between per capita incomes of less developed and developed countries. It is absolute if all countries accomplish the same level of long-term income growth. It also suggests that the less developed countries grow more rapidly than developed countries resulting in catching up by poorest countries. Conditional convergence, on the other hand, suggests that a country or a region will converge to its own steady state as every country or region has its own distinguished set of endowments.

Convergence hypothesis was initially advocated by Solow (1956) and further refined and developed by Baumol (1986) and Barro and Xavier-Sala-i-Martin (1991). Barro (2000) concluded that absolute convergence can occur only if all countries have same identical inherent features. Conditional convergence, on the other hand, implies that economies with homogeneous features are more likely to experience income convergence irrespective of their preliminary situation. These findings were further proven by Barro and Sala-I-Martin (1992) and Barro (2000). Murphy and Ukpolo (1999) conducted a detailed analysis of conditional convergence hypothesis for African region. Empirical results verified the occurrence of conditional convergence in the region for the period 1960 to 1985. Romer (1986) however raised questions about the validity of convergence hypothesis while presenting his endogenous growth theory.

The absolute and conditional convergence hypotheses have been tested by several researchers using different methodologies and data sets. The outcome appears to have attracted a mixed response from unmitigated rejection by some to ardent acceptance by others. It is in this background that current study is conducted for a set of developed and developing counties to furnish evidence regarding the convergence hypothesis. The analysis is based on latest data sets and is expected to improve understanding of convergence process in various developed and developing countries. An important contribution of this research work is the calculation of disparity intensity for each country which helps to find out how far away a country is from the average steady state. Besides, the study has also investigated the role of investment, population growth and openness in convergence process. The empirical findings are expected to help policy makers in devising relevant policies in this regard.

II. LITERATURE REVIEW

Abramovitz (1986) and Baumol (1986) conducted maiden empirical analysis of the convergence premise using Maddison's (1982) dataset. Abramovitz (1986) authenticated the convergence hypothesis by employing relative variance and rank correlation coefficient. Baumol (1986) estimated a simple regression equation to show the strong inverse association among the growth rate of Gross Domestic Product and its preliminary value. Delong (1988) in his analysis, nonetheless, concluded no income convergence rather divergence by using the same data set. Baumol and Wolff (1988) verified convergence hypothesis for a set of developed countries by applying piecewise linear and quadratic regression. Dowrick and Nguyen (1989) established the existence of income convergence for developed countries by using parameter stability test. The study commended increase in total factor productivity (TFP) as the basis of income convergence.

Barro and Sala-i-Martin (1990) studied absolute convergence for the United States of America. Barro (1991) tested the convergence hypothesis for a comprehensive data set consisting of 98 countries and rejected the absolute convergence hypothesis. The analysis also recommended that main factor causing income diversion was disparity regarding human capital stocks possessed by various countries.

Paci and Pigliaru (1997) rejected the convergence hypothesis for European region. The study was conducted for 109 regions of 12 European countries for the decade of 1980s. It also analyzed the trend of labor productivity convergence in sample countries. The results suggested that labor productivity in these countries was converging at the rate of 1.2%. Blomstrom and Wolf (1994) found that in most of the world economies labor productivity rates were experiencing convergence. The study also concluded no convergence for manufacturing sectors in these countries. Johnson (2000) analyzed income convergence across the United States for the period 1929-1993. The analysis was performed using the per capita personal income in each state relative to the United States average by applying the nonparametric methodology proposed by Quah (1996). The study however, found no empirical evidence of divergence in the cross-state income distribution. Esteban (2000) studied Regional convergence in Europe using shift-share analysis and concluded that regional specialization had a very trivial role in regional convergence. The analysis suggested policy measures to bridge the gap between developed and underdeveloped countries based on improvement of infrastructures and human capital.

Cole and Neumayer (2003) analyzed the absolute convergence hypothesis for 110 countries for the time period 1960-96 based on population weighted per capita GDP. Knack (1996) analyzed the factors influencing the speed and convergence ability of a country and concluded quality of institutions as an imperative factor in building up the convergence potential of a country. Mankiw et al. (1992), conducted comprehensive empirical analysis of conditional convergence based on cross-section data. The study was primarily based on the empirical test of various versions of Solow growth model.

Nonneman and Vanhoudt (1996) tested convergence hypothesis for a set of OECD countries. The analysis established strong empirical support for convergence among the homogeneous countries. Cho and Graham (1996) resolved that most of the poor economies typically exceed their steady state levels and consequently approach their steady state from above. Murthy and Ukpolo (1999) conducted empirical analysis of convergence phenomenon for African region. The study assessed conditional convergence by utilizing Solow model. The study concluded that African economies were converging at an overall rate of 1.7% and this sluggish convergence was ascribed to the structural problems in the region. Dobson and Ramlogan (2002) rejected conditional convergence hypothesis for Latin American region. The study was based on cross-section data from various Latin-American countries.

Karras (2010) inspected convergence hypothesis for various regions. Levine and Renelt (1992) utilized extreme-bounds analysis (EBA) to empirically analyze the conditional convergence hypothesis. The results suggested occurrence of conditional convergence for the period 1960-89.

Andrés et al. (1996) analyzed convergence hypothesis for OECD region by including inflation rate, exports growth and public-sector expenditure in their model. However, the analysis did not recommend any notable alteration to prevailing evidence on convergence in these countries. Milanovic (2003) tested convergence hypothesis for a sample of 17 rich countries and found that per capita income of these countries did not converge during the per-war era of 1870-1913. However there was a strong evidence for convergence in the inter-war period. Evans and Kim (2005) utilized dynamic random variable model to investigate convergence in Asian countries and concluded that Asian economies converged at a rate of 2%. Ismail (2008) assessed convergence hypothesis for ASEAN countries. The study utilized the pooled mean group estimator (PMGE) and found evidence for both absolute and conditional convergence. Masron and Yusop (2008), however established that convergence among ASEAN countries was subject to the extent of economic openness. The study also highlighted the role of external shocks in producing income deviance among these countries.

Ferreira (2000) and Azzoni (2001) tested convergence hypothesis for Brazil and established strong empirical support for conditional convergence in Brazil. The coefficients estimated by Ferreira (2000) were higher in 1970s as compared to future time periods. Azzoni (2001) on the basis of his findings did not support convergence before 1970. The study proposed a swift income convergence after 1970. Many other studies provided support for conditional β -convergence. Nagaraj et al. (1998) Michelis et al. (2004) and Kim (2005) examined regional convergence in India, Greece and South Korea respectively. The results concluded a higher convergence in the Korean and Indian region as compared to Greek regions. Jones (2002) applied parallel time-series technique to analyze convergence hypothesis for the Economic Community of West African States.

McCaskey (2002) analyzed convergence for a set of Sub-Saharan African countries. The study also evaluated convergence in these countries regarding government share of GDP, capital per worker, openness of economy and standards of living. The results however did not support any noteworthy convergence trends for the region. Weeks and Yudong (2003) analyzed conditional Income convergence hypothesis for various provinces of China based on the neo-classical growth model framework. The analysis suggested a methodical income deviation during the reform period as the seaside provinces were lagging behind the interior provinces regarding technological progress.

Another study by Evans and Kim (2011) empirically supported convergence hypothesis and confirmed the existence of income convergence among 13 Asian countries by utilizing the panel stationarity test by Carron-Silvestre et al. (2005). Nahar and Inder (2002) evaluated trend regressions for output gap and squared demeaned output from the USA and used the resultant average slopes for the test of absolute convergence for OECD countries. All countries except Germany, Iceland and Norway showed high convergence tendency towards their average income for the period 1950-98.

III. DATA DESCRIPTION AND METHODOLOGY

Present study has tested convergence hypothesis for 18 developed and 42 developing countries. (The countries are randomly selected and a list of these countries is provided in appendix 1). All the data for present study is taken from Alan Heston, Robert Summers and Bettina Aten Penn World Table version 7.11. Following is a brief description of the variables used in this study:

- Real GDP per capita (constant prices) is a measure of value of goods and services produced in an economy excluding the impact of increase in price level.
- Investment share of PPP converted GDP per capita at 2005 constant prices.
- Population. (In thousands).
- Openness (at 2005 constant prices (%))

¹ http:// pwt.sas.upenn.edu/php_site/pwt_index.php.

To analyze the hypothesis of absolute and conditional convergence Pooled Least Squares with time dummies and cross-section weights (PCSE) standard errors is used.

EMPIRICAL RESULTS

Absolute Convergence

The absolute convergence hypothesis is tested twice firstly for the set of 18 developed countries and secondly for the overall set of 60 countries. The hypothesis tested in both cases is

H₀: $\alpha \ge 0$ (there is no absolute convergence)

H_A: $\alpha < 0$ (there is absolute convergence)

The null hypothesis states that growth rate of GDP does not depend on the preliminary level of GDP per capita. The alternative hypothesis however, designates that growth rates and initial GDP per capita are inversely associated and hence, convergence occurs. To test the hypothesis following model is estimated.

$$\Delta \ln (\mathbf{Y}_{i,t}) = \mathbf{a} - \bar{\alpha} \ln (\mathbf{Y}_{i,t-1}) + \theta_t + \varepsilon_{i,t}$$
[1]

Where $\Delta \ln (\mathbf{Y}_{i, t})$ is the GDP per capita growth rate of the country i at time t, a is the intercept, θt is the time fixed time effects and $\alpha = \left(\frac{1-e^{\beta t}}{T}\right)$ where β is the annual speed of convergence. A significant

negative value for $\bar{\alpha}$ implies absolute beta convergence, while a positive value implies non-convergence. Following table provides the estimation of above model for both data sets.

TABLE 1

Absolute Convergence (1970-2010)

Variables/Regression	Developed countries	Full sample	
Constant	0.20867	-0.00799	
	(7.33734) *	(-0.84634)	
ln Y (-1)	-0.01866	0.00339	
	(-6.40767)	(3.16200)	
Fixed Effects (period)			
1970	0.00391	0.01029	
1980	-0.00066	0.00604	
1990	0.00334	-0.00894	
2000	0.00429	-0.00726	
2010	-0.00273	0.00085	
\mathbb{R}^2	0.56212	0.41398	
Adj. R ²	0.53476	0.37828	

*t-values are provided in the parenthesis

Refereeing to the second column of table 1 the estimated coefficient of $\bar{\alpha}$ for developed countries, is -0.01866, which is highly significant and therefore leads to the refutation of null hypothesis. This result is in line with the forecasts of neoclassical growth model and advocates that absolute convergence exists among developed countries. The estimated coefficient implies that a 1% increase in initial per capita income will lead to 1.866% increase in growth rate. The negative coefficient indicates that the difference among these homogeneous countries tends to reduce as each economy approaches the steady state.

The model is re estimated for the full sample consisting of 18 developed and 42 developing countries. (*The results are summarized in column 3 of Table 1*). The estimated coefficient associated with log of real GDP per capita is 0.00339 which is positive and significant (t-value =3.162). It means that there is inadequate indication to discard the null

hypothesis. It can be concluded that absolute convergence does not exist for the whole sample due to heterogeneous and varied structure of economies among developed and less developed countries. The phenomenon can be ascribed to divergences between the countries and consequently their steady states are different. The fixed effect (period) of 1970 to 1980 is positive while it is negative for the period 1990 and 2000. Hence the results indicate the absence of absolute convergence for of output per capita for the combined sample.

Conditional Convergence

The notion of conditional convergence can be described as the relationship between the growth rate and the gap between the actual levels of GDP versus its own steady state. The neoclassical model envisages conditional convergence whereby countries tend to converge to their own steady states owing to their particular country-specific features, such as level of technology, openness, investment, population and rule of law. Mankiw et al (1992) and Barro and Sala-i-Martin (1995) keeping in view the heterogeneity of various economies advocated the conditional convergence hypothesis. In current section following hypothesis is tested to examine the occurrence of conditional convergence.

H₀: $\alpha \ge 0$ (there is no conditional convergence)

H_A: $\alpha < 0$ (there is conditional convergence)

To test the conditional convergence hypothesis, following model is estimated

$$\Delta \ln (\mathbf{Y}_{i,t}) = \mathbf{a} - \alpha \ln (\mathbf{Y}_{i,t-1}) + \mathbf{Y}_t + \mathbf{\theta}_t + \mathbf{u}_{i,t}$$
[2]

Where $\Delta \ln (\Upsilon_{i, t})$ is the GDP per capita growth rate of the country *i* at time *t*, a is the intercept, θ_t is the time fixed time effects, Υ_t are the country fixed effects and $\alpha = \left(\frac{1-e^{\beta t}}{T}\right)$ where β is the annual speed of convergence. The estimation results are provided in Table 2. The

convergence. The estimation results are provided in Table 2. The estimated coefficient value for log of real GDP is -0.021470, which is highly significant. (t-value is -4.25713). Therefore, the hypothesis of conditional convergence is accepted for the overall sample countries.

TABLE 2

Conditional Convergence for 60 Countries (1970-2010)

Variables/Regression	Full sample
Constant	0.19858
	(4.73866) *
ln Y (-1)	-0.02147
	(-4.25713)
Fixed Effects (period)	
1970	-0.00128
1980	0.00164
1990	-0.00697
2000	-0.00209
2010	0.00870
R ²	0.57502
Adj. R ²	0.45305

*t-values are provided in the parenthesis.

Next step is to find the annual speed of convergence. We have $\alpha = \left(\frac{1-e^{\beta t}}{T}\right)$ where α is the estimated coefficient, β^2 is the annual speed

of convergence and T is the number of years per period. By substituting the calculated value, we have

 $(1 - e - \beta^* 10)/10 = -0.021470$ $1 - e - \beta^* 10 = 0.21470$ $e - \beta^* 10 = 0.7853$

By taking logarithm of both sides we get

 $^{2}\beta = -\frac{1}{10}\ln(1+\alpha)$

$\beta = 0.02418$ (Annual speed of convergence)

Half-life computation formula $(0.69/\beta)^3$ can be utilized to find the distance from steady state. The results propose that it will take about 25 to 28 years to fill half the original distance from the steady state, which some people in the present generation can also witness. This conclusion upgrades the existing empirical evidence which contends that, the time required for substantial convergence is approximately many generations.

Disparity Level for each Country

Current section provides disparity level for each country based on demeaned values. To find the income disparity, the log GDP per capita data for the whole set of 60 countries is altered by taking deviations from their cross section mean. This practice is similar to introducing time dummies. The fixed effect is expelled from the model and the estimation is used to approximate the individual income effects. Following model is estimated to calculate income disparity.

$$\mathbf{D}_{yit} = -\beta_{yit} - 1 + \gamma_i + \varepsilon_{it}$$
 [3]

Where *yit* is $\ln\left(\frac{yit}{\overline{y}t}\right)$ and $\overline{y}t$ is the mean of *yit* across the country

i at time *t*. The inverse association among the time-demeaned preliminary GDP per capita and the average growth rate are tested. (*For details see Appendix II*). The estimated value of β is -0.22278. It advocates conditional convergence for each country and indicates a "provisional dynamics" by each country to their corresponding steady states. The positive coefficient value for a country suggests that the country is growing quicker as paralleled to the sample mean, while a negative coefficient suggests a parting from the sample mean; hence, such country is far behind the other countries.

The empirical results also suggest that countries have diverse steady state which is revealed by a different intercept value for each country. The results show that most developing economies have negative constants and 26 out of 50 countries have significant coefficients. All the

 $^{^3}$ Half-life computation formula is helps to estimate the time needed by a country to reach steady state and is given by t = - ln (0.5) / β

developed countries have positive and significant constants. The next logical step is to compute income disparity for each country which aids to assess income disparities and variances in living standards. The disparity for each country is computed as follows:

$$Dsi = \frac{yi}{\beta}$$

Where D_{si} is the disparity level for each country and is obtained by dividing estimated fixed effect of each country by its estimated coefficient of regression equation. Income disparities abet to understand the relative position of a country with regard to its steady state position. It also provides the information as to how promptly a country will approach its steady state.

TABLE 3

Country	Disparity level	Country	Disparity level
ARG	$-0.49349 (0.1887)^4$	ITA	0.77830 (0.0114)
AUS	0.865293 (0.0041)	KOR	1.04901 (0.0062)
AUT	1.02127 (0.0000)	LAO	-1.63304 (0.0362)
BFA	-3.13021 (0.0000)	LBY	-0.28292 ((0.3914)
BOL	-1.78238 (0.0000)	LUX	1.61706 (0.0002)
BRA	-0.47679 (0.3090)	MEX	-0.25738 (0.4145)
CAF	-3.82938 (0.0000)	MNG	-1.58730 (0.0421)
CHE	1.45656 (0.0000)	MWI	-3.24261 (0.0004)
CHI	-0.81937 (0.3835)	MYS	0.04951 (0.89900)
CHL	-0.38841 (0.3117)	NGA	-2.75662 (0.0000)
CIV	-2.58425 (0.0000)	NLD	0.90727 (0.0014)
COG	-1.89716 (0.0001)	NOR	1.29455 (0.0000)
CRI	-0.44945 (0.1151)	NZL	0.34222 (0.1332)

Disparity Level

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⁴ P-values are provided in the parenthesis,

Country	Disparity level	Country	Disparity level
СҮР	0.52998 (0.1151)	РАК	-1.84334 (0.0002)
DNK	0.83288 (0.0045)	PAN	-0.23929 (0.4839)
DOM	-0.41336 (0.2711)	PHL	-1.73919 (0.0001)
DZA	-1.24719 (0.0000)	PRT	0.56243 (0.0333)
EGY	-1.12914 (0.0289)	PRY	-1.40658 (0.0081)
ESP	0.83194 (0.0068)	RWA	-3.22888 (0.0000)
ETH	-3.49429 (0.0000)	SGP	1.71936 (0.0000)
FRA	0.812236 (0.0037)	SOM	-4.19651 (0.0000)
GAB	-0.305952 (0.5603)	TUN	-0.81506 (0.0260)
GER	0.763039 (0.0017)	TUR	-0.43100 (0.0021)
GHA	-2.404614 (0.0000)	TWN	1.33243 (0.0000)
GTM	-1.015935 (0.0099)	UKR	0.84949 (0.0044)
HKG	1.495421 (0.0000)	USA	0.95385 (0.0012)
HND	-1.71680 (0.0000)	VEN	-0.77475 (0.0182)
HTI	-2.84486 (0.0000)	ZAR	-4.81124 (0.0001)
IDN	-1.23601 (0.0249)	ZMB	-2.87346 (0.0002)
IND	-1.62433 (0.0127)	ZWE	-4.03388 (0.0000)

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A positive disparity level reflects that a country's steady state level is above the average steady state level while a negative steady state value indicates that the country is below the average steady state level. Table 3 provides the GDP per capita disparity results showing a maximum of 1.72 for Singapore which reflects that Singapore is 172% richer than the average (mean) country. Correspondingly, ZAR has a value of -4.811 which presents that it is 481% poorer than the average country. Pakistan is found to be 184% poorer than the average country. It is evident from the results that all the developed countries are above average steady state level with significant p-values.

IV. CONDITIONAL CONVERGENCE, OPENNESS, INVESTMENT AND POPULATION GROWTH

Fixed effect panel estimation approach is used to estimate regressions (2). Control variables play an important role in testing the conditional convergence hypothesis. The inclusion of control variables aids to understand the effects of various factors on economic growth. In current study, investment to GDP ratio (K), trade openness (O), population growth (P) and Rule of law (R) are taken as control variables. Investment to GDP ratio (K) and trade openness (O) is included because they are important components of aggregate demand and hence have implications for economic growth. Rule of law (R) is used as a policy stability variable. Population growth (P) is included to incorporate social conditions of a country. For Openness and Investment mean values are used to account for instability of these variables arising due to business cycles. It helps to measure the effects of these variables on economic growth. Keeping in view the neoclassical growth model there is an expectation of an inverse relationship among population growth and economic growth and a positive relationship between investment and economic growth. The relationship between openness and economic growth and rule of law and economic growth is also expected to be positive.

The estimated coefficient for log of real GDP after inclusion of control variables is is -0.002133 which is insignificant and suggests the absence of conditional convergence. It submits that the control variables are not strong enough to produce a level difference which can lead to income convergence among countries. Hence these factors do not impact the steady state position of countries. All the control variables investment, openness, Rule of law and population growth have expected signs as supported by economic theory. For example, one-unit increase in investment share leads to 0.01 unit increase in GDP growth.

Fourth column of Table 4 presents the results of conditional convergence for18 developed countries by eliminating the fixed effects. Moreover, it also adds the investment, openness and population growth as control variables. The value of the estimated coefficient of log GDP per capita is -0.021339 which is highly significant. The results suggest conditional convergence amongst countries. The coefficients pertaining

to investment and openness are positive but only investment coefficient is found significant. The coefficient of population growth is negative and insignificant. Hence, population growth and openness are not significant determinants.

TABLE 4

Conditional Convergence, Inclusion of Investment, Population Growth and Openness as Control Variables (1970-2010)

Variables/	Full sample	Full sample	Developed	
Regression	(excluding R)	(including R)	Countries	
Constant	0.02154	0.03546	0.21345	
	(1.58242) *	(2.16584)	(6.35026)	
ln Y (-1)	-0.002133	-0.003937	-0.02133	
	(-1.56630)	(-2.15714)	(-6.34711)	
Investment (K)	0.001100	0.00100	0.000747	
	(6.60344)	(5.82718)	(2.91379)	
Openness (O)	0.000048	0.000044	0.000024	
	(2.17601)	(2.06426)	(1.08596)	
Population (P)	-0.637353	-0.49709	-0.025353	
	(-3.75880)	(-2.53132)	(-0.13805)	
Rule of Law (R)		0.004130		
		(1.85864)		
Fixed Effects (period)				
1970	0.00993	0.00859	0.00993	
1980	0.00475	0.00427	0.00375	
1990	-0.00614	-0.00640	0.00433	
2000	-0.00603	-0.00553	0.00100	
2010	-0.00150	-0.00008	0.00459	
R ²	0.31711	0.33756	0.52711	
Adj. R ²	0.29753	0.30807	0.49753	

*t-values are provided in the parenthesis

Column 2 and 3 summarize the results of regressions pertaining to full sample with and without including rule of law as a control variable respectively. In column 2 estimated coefficient value for log GDP is negative but not significant indicating absence of conditional convergence. The coefficients on population growth, investment and openness have the expected signs as suggested by neo-classical growth theory and are highly significant. Conditional convergence hypothesis is tested again after including rule of law as a control variable and the results are summarized in column 3 of table 4. The coefficient of log GDP has not only a negative sign but significant as well. Its value is -0.003937 with a t-value of -2.157 indicating conditional convergence. The coefficient on rule of law also has the expected sign and is significant as well. These results put forward that population growth; investment, openness and rule of law are all significant determinants.

V. CONCLUSION

This paper has empirically investigated the convergence hypothesis for a set of developed and developing countries. The study has tested both absolute convergence hypothesis (using beta convergence methodology and conditional convergence hypothesis (by including the appropriate controls). The study has employed the pooled cross-section, time series data set, which offers new insights about the convergence tests for real GDP per capita. Current analysis concludes absolute convergence for having homogeneous characteristics and countries conditional convergence for set of countries having diverse features. The study also calculated the disparity level for each country depicting the expanse of each country from the mean steady state. Investment, openness, population growth and rule of law are important determinants in this regard.

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APPENDIX

TABLE I

Developed Countries		Less Developed Countries	
Sr. No	Name	Sr. No	Name
1	Australia (AUS)	1	Argentina (ARG)
2	Austria (AUT)	2	Algeria (DZA)
3	Cyprus (CYP)	3	Burkina Faso (BFA)
4	Denmark (DNK)	4	Bolivia (BOL)
5	France (FRA)	5	Brazil (BRA)
6	Germany (GER)	6	Central African Republic (CAF)
7	Hong Kong(HKG)	7	China (CHI)
8	Italy(ITA)	8	Chile (CHL)
9	South Korea (KOR)	9	Ivory Coast(CIV)
10	Luxembourg (LUX)	10	Congo (COG)
11	Netherlands (NLD)	11	Costa Rica (CRI)
12	Norway (NOR)	12	Dominican Republic (DOM)
13	New Zealand(NZL)	13	Egypt (EGY)
14	Portugal(PRT)	14	Ethiopia (ETH)
15	Singapore (SGP)	15	Gabon GAB)
16	Spain (ESP)	16	Ghana (GHA)
17	Taiwan (TWN)	17	Guatemala (GTM)
18	United States of America (USA)	18	Honduras (HND)
		19	Haiti (HTI)
		20	Indonesia (IDN)
		21	India (IND
		22	Laos (LAO)
		23	Libya (LBY)
		24	Mexico (MEX)
		25	Mangolia (MNG)
		26	Malawi (MWI)
		27	Malaysia (MYS)
		28	Nigeria (NGA)
		29	Pakistan (PAK)
		30	Panama (PAN)
		31	Philppine (PHL)
		32	Paraguay (PRY)
		33	Rwanda (RWA)
		34	Somalia (SOM)
		35	Tunisia (TUN)
		36	Turkey (TUR)
		37	Tanzania (TAN)
		38	Ukarajne (UKR)
		39	Venezuela (VEN)
		40	Zambia (ZAM)
		41	Zar (ZAR)
		42	Zimbabwe (ZWF)
		-r <i>L</i>	

TABLE II

Conditional Convergence for 60 Countries: Elimination of Dummies and Country Fixed Effects

Variable	Coefficient	Variable	Coefficient
β	-0.02227 (-4.21741) *		
ARG	-0.01099 (-1.31827)	ITA	0.01733(2.54988)
AUS	0.01927 (2.90225)	KOR	0.02337 (2.76086)
AUT	0.02275 (4.29858)	LAO	-0.03638 (-2.10708)
BFA	-0.06973 (-4.74153)	LBY	-0.00630 (-0.85869)
BOL	-0.03970 (-5.16401)	LUX	0.03602 (3.77085)
BRA	-0.01062 (-1.01961)	MEX	-0.00573 (-0.81744)
CAF	-0.08531 (0.01357)	MNG	-0.03536 (-2.04365)
CHE	0.01808 (2.15217)	MWI	0.07223 (-3.57556)
CHI	0.01825 (-0.87315)	MYS	0.00110 (0.12711)
CHL	-0.00865 (-1.01388)	NGA	-0.06141 (-404006)
CIV	-0.05757 (-4.52933)	NLD	0.02021 (3.22625)
COG	-0.04226 (-3.88798)	NOR	0.02884 (4.43619)
CRI	-0.01001 (-1.58171)	NZL	0.00762 (1.50682)
СҮР	0.01180 (2.55850)	PAK	-0.04106 (-3.73117)
DNK	0.01855 (2.87095)	PAN	-0.00533 (-0.70116)
DOM	-0.00920 (-1.1.317)	PHL	-0.03867 (-4.06938)
DZA	-0.02778 (-5.01872)	PRT	0.01253 (2.14107)
EGY	-0.02515 (-2.19816)	PRY	-0.03133 (-2.67031)
ESP	0.01853 (2.73051)	RWA	-0.07193 (-4.46238)
ETH	-0.07784 (-4.23473)	SGP	0.03830 (5.619490
FRA	0.01809 (2.93458)	SOM	-0.09349 (-5.29444)
GAB	-0.006816 (-0.58332)	TUN	-0.01815 (-2.24052)
GER	0.016399 (3.17821)	TUR	-0.00960 (-3.11125)
GHA	-0.05357 (-4.36265)	TWN	0.02968 (6.33419)
GTM	-0.02263 (-2.60130)	UKR	0.01892 (2.87331)
HKG	0.03331 (7.09104)	USA	0.02126 (-2.377779)
HND	-0.03824 (-4.46037)	VEN	-0.01726 (-2.37779)
HTI	-0.06337(-4.98105)	ZAR	-0.10718 (-4.12406)
IDN	-0.02753 (-2.25851)	ZMB	-0.06401 (-3.78778)
IND	-0.03618 (-2.51059)	ZWE	-0.08986 (-4.83601)

* values in parentheses are t-values

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INTELLECTUAL CAPITAL DRIVEN PERFORMANCE: ROLE OF INNOVATIVE PERFORMANCE AND BUSINESS PROCESS CAPABILITIES

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Abstract. Theory of resource based view (RBV) postulates intangible resources as strategic resources which tend to provide sustainable competitive positioning for a firm to survive in a fast-paced highly dynamic market place. This study attempts to demonstrate the impact of intangible resources i.e. intellectual capital (IC) resources on firms' performance. Further, the paper also aims at specifying the optimal mediating mechanism for IC driven performance in the presence of business process capability and innovative performance as intermediate measures. Using the key informant approach a survey was conducted and a valid sample of 660 middle and senior level employees was considered for analysis. Convergent and discriminant validity is examined by observing the values of loadings and average variance extraction (AVE) before proceeding for further model estimation. However, fitness of the model is examined through observing the values of absolute, incremental and parsimonious fit measures using confirmatory factor analysis (CFA). The results of the study imply that IC's components not only directly

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affect the performance but it also indirectly influences the performance through business process capability and innovative performance. Based on the findings of the study, this piece of effort suggests that managers need to explore more intellectual resources in order to align the business process capability and innovative performance for superior performance outcomes.

Keywords: Intellectual Capital, Business Process Capability, Innovative Performance, Performance

JEL classification: O34, L21, O31, L25

I. INTRODUCTION

A recent change in global knowledge economy consisting of intangible resources provides sustainable performance to firms in a turbulent and competitive environment (Teece *et al.*, 1997; Subramaniam and Youndt, 2005a, 2005b). In era of knowledge based economy, the appearance of intellectual capital (IC) has attracted lot of recognition as a driver of competitive positioning (Sharabati *et al.*, 2010), where most of the firms have failed to understand its significance in earlier (Collis, 1996). This influential phenomenon has led the aim of transition of traditional industrial economy in knowledge economy (Guthrie *et al.*, 1999). According to theory of resource based view (RBV), intangible assets cognized as knowledge resources provide better performance outcomes than tangible resources (Bogner and Bansal, 2007).

Previous research defines IC as personnel skills, firms' routines, network relationships and collective know-how that reside inside of intellectuals of organization (Kong, 2008; Stewart, 1997). It is also recognized as strategic valuable resource for firms' performance to gain constant competitive edge (Schiuma and Lerro, 2008; Kong and Prior, 2008; Chen, 2008). Knowledge economy presented it as a source of 'economic value' covering three major facets of non-physical assets of a firm which includes human, organizational and social capital. Extant of strategic management literature postulates that intellectual capital is a valuable and non-compatible resource used to link firms' capabilities with sustainable performance (Karkoulian *et al.*, 2013; Barney, 1991). Interestingly, recent academic research views IC as a key strategic driver for business growth and performance (Tovstiga and Tulugurova, 2007;

Huang and Liu, 2005). However, very little attempts were made to know that how innovation and business process capabilities mediate the relation to bring out better IC oriented performance.

Although, it is robustly accepted that organization capability to innovate is extensively relies on its 'ability to exploit knowledge or intellectual assets effectively (Subramaniam and Youndt, 2005a). Innovation is acknowledged as driving element to leverage the value creation and performance at firms' level (Griffith *et al.*, 2006). Firms' capability to get sustainable performance outcomes are based on their dynamic capability i.e. innovative performance through leveraging, grasping and reconfiguring IC appropriately (Hsu and Wang, 2012). Further, innovative performance provides competitive positioning in a dynamic environment if the firms integrate, sensing and restructure the internal, external and human capability efficiently (Teece *et al.*, 1997).

Massive investments on knowledge resources e.g. intellectual capital are required to innovate the organizational processes, structures and products for superior performance outcomes. Recent academic research points out the strategic role of innovation for leveraging competiveness and IC driven performance (Gao et al., 2009). Studies found that intellectual referred as knowledge assets are the basic inputs or treated as raw material for value creation process of organization which comes through innovation to leverage the superior firms' performance over the period (Marr et al., 2004; Gao et al., 2009). Similarly, studies also imply that IC is considered as primary source of input for value creation through aligning business process capabilities of organization (Gold et al., 2001; Smith and Mills, 2011). Few studies advocate that business process capability in terms of customers' and suppliers' intimacy and flexible production processes positively augment further the organizational performance measures (Rai et al., 2006; Santhanam et al., 2007; Ray et al., 2004). Recent study points out that business process capability mediates the relation for IC driven performance (Wu and Chen, 2014). This study advocates that firms required substantial investment on internal, external and human capital which further help to structure organization's inside-out, outside-in and spanning capabilities to get better performance standard.

Though, plenty of academia research addresses the relationship of IC and firm's performance, however, many firms belonging to knowledge oriented sectors with experienced human capital, dynamic organizational processes and structures, information systems and diversify intimate with customers and suppliers failed to yield innovative performance to get the better performance outcomes (Han and Li, 2015). Previous debate also concludes that more investment initiatives on knowledge assets e.g. 'human capital, structural and relational capital' improves the firm's innovative capability in terms of operational excellence and product development and business process capability i.e. inside-out, outside-in and spanning could be a result of better sales growth and revenues (Wang and Wang, 2012; Huang *et al.*, 2010). However, there is a scarcity of literature that how both concepts i.e. innovative performance and business process capability works together to mediate the relationship for IC driven performance.

II. THEORETICAL BACKGROUND AND HYPOTHESIS

INTELLECTUAL CAPITAL (IC) AND PERFORMANCE

The conceptualization of IC is very difficult to understand due to dynamic and invisibility. It often uses interchangeable as intellectual capital, intellectual assets or knowledge assets. IC comprises entirety of all knowledge assets or intangible assets that determines the firm's superior performance (Roos and Roos, 1997; Subramaniam and Youndt, 2005). Initially, IC was used to capture the difference between organization book and market value (Stewart, 1994). Later on, research conceptualized IC as hidden asset difficulty to find on companies' balance sheet; intellectual property rights, organizational philosophy and culture, employees experience and skills (Edvinsson and Malone, 1997; Stewart and Ruckdeschel, 1998). These assets paved the way to form the positioning (Youndt et al., 2004; Sharabati et al., 2010). Literature suggests that IC works for value creation and extraction though utilizing knowledge held by employees, captured in organizational data bases, business processes and relational capital (Zharinova, 2011; Sullivan, 1999; Youndt et al., 2004). As recommended in introduction that knowledge drives the economy to get competiveness which comes through optimal utilization of scarce IC with every possible means (Sveiby, 1998; Dumay, 2013; Edvinsson and Sullivan, 1996). IC is the

composition of human capital, structural capital and relational capital (Bontis, 1998; Rehman *et al.*, 2011; Roos *et al.*, 1997; Malone, 1997).

Human capital refers to integration of explicit and tacit knowledge of individual though education, trainings, mental agility and previous employment (Sveiby, 1997; Roos et al., 1997). Studies also describes that human capital is the intellectual ability, experience and knowledge of employees which resides in their brain and used by firm's staffs and executive (Subramaniam and Youndt, 2005; Schultz, 1961). Actually, organization needs employees with excellent capability of problem solving to make effective decisions. Therefore, it is considered a valuable strategic and dynamic resource in a rapidly changing environment (Mengistae, 2006; Bontis et al., 2007). As organization services and products are always rendered and provided by employees, hence it always anticipated that organization performance in terms of customer intimate, operational excellence and product development is closely connected with human capital efficiency (Cabello-Medina et al., 2011). Further, studies indicate that firms which invest more on human capital tend to get better financial and non-financial performance (Wang et al., 2011; Seleim et al., 2007).

H1: Human capital positively influences overall performance of pharmaceutical firms.

Structural capital refers to institutionalization of knowledge resides in organizational procedures, rules, routines and databases (Subramaniam and Youndt, 2005; Schultz, 1961). Hsu and Wang, (2012) conceptual structural capital as information systems and organizational process which is a core of firm to facilitate the flow of information required to increase the operational performance (Cabrita and Bontis, 2008). It is a valuable strategic resource and employees do not take home when leave the organization. Further, organizational process provides the availability of knowledge resources to achieve better performance outcomes (Youndt et al., 2004; Bontis, 1998). Firms with week structural capital in terms of poor procedures, routines and systems find difficulties to harvest the better financial performance. Therefore, firms attempt to integrate the structural capital to strengthen organizational processes which tend to improve the operational efficiency in terms of lowering the production cost and quality and enhanced problem solving capability

(Zangoueinezhad and Moshabaki, 2009). Further strong structural support give momentum to firm's performance by leveraging innovative culture and resource deployment (De Brentani and Kleinschmidt, 2004). Nevertheless, research also indicates that strong structural ties propel the organization performance by enhancing value creation activities (Phusavat *et al.* 2011).

H2: Structural capital positively influences overall performance of pharmaceutical firms.

Relational capital contains knowledge embedded that comes through interactions with all the stakeholders such as customers, suppliers, other internal and external partners (Roos *et al.*, 1997). Organizational strategic alliances with internal and external stakeholder are almost inevitable for sustainable performance (Hsu and Wang, 2012). Supportive relational ties enable the management staff to identify core issues for further attention and find the better ways to do business by learning from other and thus becoming more novel and innovative (Dewhurst and Navarro, 2004). This concludes that strong strategic alliances exploit core business competencies, reduce the production cost through innovation methods and improves the product quality.

H3: Structural capital positively influences overall performance of pharmaceutical firms.

INTELLECTUAL CAPITAL (IC), INNOVATIVE PERFORMANCE AND OVERALL PERFORMANCE

Resource based view (RBV) claims that organization possesses heterogeneous intangible resources which are rare, non-imitable and nonsubstitutable that determines firms' capability to innovate and competitiveness (Barney, 1991). Human capital is highly supportive and compatible for innovative performance because staff's skills, experience and creativity improves the innovative capability of firm to do things differently (Subramaniam and Youndt, 2005). High human capital efficiency in terms of good education, training and sophisticated knowledge and abilities improves cognitive capabilities of individuals to have a better job performance through efficient activities (Hsu and Wang, 2012). Such human capital efficiencies improve problem solving skills of employees and ability to make strategic decision which turns to improves innovative performance of organization (Bontis et al., 2007; Martín-de-Castro et al., 2011).

H4: Human capital positively influences innovative performance of pharmaceutical firms.

Structural capital is best describes as organizational processes and information systems (Martín-de-Castro et al., 2011). It is an embedded knowledge in routines, manuals, information systems, copyrights and trademarks that determines the firms' capabilities to innovative (Zangoueinezhad and Moshabaki, 2009). Further, organizational processes coordinate firm's strategies, culture and routines to enhance operational performance. Recent research indicates effective organizational structure in terms of inimitable routines and procedures likely to contribute more towards innovative performance and value creation activation than week structural capital (Widener, 2006; Bontis, 1998).

H5: Structural capital positively influences innovative performance of pharmaceutical firms.

Constructive social exchange relationship is a critical factor for value creation and deployment of resources (Subramaniam and Youndt, 2005) used to get important information from stakeholders e.g. customers, suppliers and partners. Such strategic alliances directly provide access to network resources (Subramaniam and Youndt, 2005). Innovative performance comes through extracting and sharing embedded knowledge with customers more importantly manufacturing firms would be able to achieve operational excellence through focusing close relationship with suppliers that ultimately determines the better operational and economic performance (Bonner and Walker, 2004; Nahapiet and Ghoshal, 1998). Recent research conducted by Batjargal, (2003) and Luo, (2003) found that innovative performance has positive connection with relational capital in emerging economies.

- H6: Structural capital positively influences innovative performance of pharmaceutical firms.
- H7: Innovative performances positively influence the overall performance of pharmaceutical firms.

INTELLECTUAL CAPITAL (IC), INNOVATIVE PERFORMANCE AND OVERALL PERFORMANCE

Davenport (1993) argues that business process capabilities are firm specific activities used to transform the inputs into outputs. Business process capabilities used to determine the firm's capabilities to create value and competence for the organization. Research classifies business process capabilities into outside-in, inside-out and spanning capabilities (Fathy and Hooley, 2002; Day, 1994). Outside-in is an externally intensive capability which determines the firm ability to align internal processes with external setting (Wade and Hulland, 2004). These capabilities help to forecast the future market requirements of a firm through recognizing competitors' inclination and sustainable relationship with stakeholders (Fathy and Hooley, 2002). Inside-out capabilities are the firm's internal competences, usually triggered out to pursue innovation, product development, financial arrangements and workforce management (Day, 1994). These capabilities are structured to align the matching strategies e.g. internal core competencies and weaknesses with external opportunities and challenges (Wade and Hulland, 2004). Nevertheless, inside-out capabilities stress effective infrastructure management and operational excellence which tends to provide long term competitive positioning based on different value propositions like brand recognition, customer intimacy, customer retention and product improvements and developments (Wade and Hulland, 2004). Spanning capability refers to inter-and intra-firm capability used to conduct internal and external analyses (Wade and Hulland, 2004). Spanning capability permits the firm to conduct better SWOT analysis through exploiting internal core competencies (strengthens), minimizing weaknesses, exploring external opportunities and counterbalancing external threats. Further, this capability enables the firm to conduct strategy analysis and choice in terms of input, matching and decision stage for strategy formulation (Banker et al., 2006). So, based on these three formative constructs, this study attempts to examine the mediating role of business process capability for IC driven performance.

Intellectual assets play an important role to re-design the business processes (Brynjolfsson and Hitt, 2003). Both intellectual assets and business processes are strategically important to restructure the business design, value creation and better performance outcomes (Easterby-Smith and Lyles, 2003).

- H7: Human capital positively influences business process capabilities of pharmaceutical firms.
- H8: Structural capital has a positive impact on business process capabilities of pharmaceutical firms.
- H9: Relational capital has a positive impact on business process capabilities of pharmaceutical firms.
- H10: Business process capabilities have a positive impact on overall performance of pharmaceutical firms.

III. METHODOLOGY AND FINDINGS

SAMPLES AND DATA COLLECTION

This study employs the survey method (instrumentation) to collect the data from respondents in context of Pakistan. Survey approach provides multiple advantages than qualitative approach such as precise measurement of theoretical constructs, quick data collection, use of latest statistical techniques, and better quantitative identification of relations multifaceted among the variables. The instrument (questionnaire) used in this study comprises two parts is given in appendix. First part captures the general or basic information of industry and respondents (based on nominal scale) including industry type, number of employees and annual revenue. However, respondents' characteristics include qualification, age, gender, designation and working experience in present organization. Second part uses the fivepoint Likert scales rating from strongly disagree to strongly agree which captures the information related to variables of interest e.g. human capital, structural capital, relational capital, innovative performance, business process capability and overall performance of firms.

Using a key informant approach, a total of 1338 questionnaires were distributed via post mail among middle and senior level employees, out of which 757 were received representing 56.54 % response rate. Out of 757, a final 660 questions were considered for analysis and 97 questions were discarded to due incomplete and ambiguous response thus

representing 49.33% response rate which is a quite appropriate response for this study.

INSTRUMENTATION

To establish reliability and content validity of the latent constructs, this study attempts to adopt all the measurement items of model from available literature. First, independent variable 'intellectual capital' comprises three sub-constructs i.e. human capital, structural capital and relational capital. Human capital includes five items which were adapted from the work of (Subramaniam and Youndt 2005; Bontis, 1998; Youndt et al. 2004; Chen et al. 2009). Structural capital comprises five measurement items, adapted from (Wu et al. 2007; Bontis, 1998; Hsu and Fang, 2009). Relational capital items were designed from the work of (Bollen et al., 2005; Longo and Mura, 2011; Bontis, 1998; Hsu and Fang, 2009). Second, this study uses two mediating variables innovative performance and business process capability. Innovative performance is measured using four constructs adapted from the work of (Wu et al., 2007 and Roberts and Grover, 2012). This study divides business process capability into three sub-constructs outside-in capability, inside-out capability and spanning capability and their measurement items were adapted from the work (Wade and Hulland, 2004; Banker et al. 2006). A total of 12 measurement items were used containing four items for each sub-constructs of business process capability. We used the sum of these three sub-constructs to measure the latent construct i.e. business process capability. Finally, this study uses four sub-constructs (i.e. operational performance, financial performance, customers' intimacy and product leadership) to estimate the overall performance of pharmaceutical firms. Each sub-construct contains two measurement items and there were a total of eight items were used to measure this latent constructs.

MEASUREMENT MODEL

This study uses the confirmatory factor analysis (CFA) by employing structural equation (SEM) model to observe the overall fitness of the measurement model. Convergent and discriminant validity of latent constructs were judged before proceeding to test the hypothesized model. Convergent validity postulates that items used for a construct are assumed to measure a single construct. However, convergent validity argues that items used to measure a construct do not estimate the unrelated constructs (Kline, 2010). Keeping in view, we have examined the convergent validity through observing the values of loading items (λ), composite reliability (CR) and average variance extraction (AVE). In order to establish the convergent and discriminant validity of the constructs, Fornell and Larcker, (1981) argue that loading items should be statistical significant and greater than 0.60, composite reliability should be greater than 0.80 and average variance extraction should be more than 0.50 in the entire measurement model. However, Hair *et al.*, (1998) indicate that loading values exceeding 0.35 have practical significance for further model investigation. Further, Bagozzi and Yi, (1988) proposed that benchmark for convergent validity validation is (C- $\alpha \ge 0.7$; AVE ≥ 0.5). Table 1 indicates that all the convergent validity indicators i.e. loading values and AVE fall within acceptable range 0.35 and 0.50 respectively.

TABLE 1

Constructs	Items	Loading	Cronbach's	AVE	Mean	S.D
		Values	α			
Human Capital	HC1	.752	0.74	0.70	2.30	1.04
	HC2	.744			2.28	.98
	HC3	.687			2.38	1.00
	HC4	.672			2.22	.98
	HC5	.622			2.26	.93
Structural Capital	SC1	.573	0.74	0.66	2.26	.93
L	SC2	.709			2.30	1.04
	SC3	.660			2.20	1.00
	SC4	.729			2.28	1.00
	SC5	.681			2.34	.99
	SC6	.611			2.28	.97

Results of EFA for Convergent Validity

Constructs	Items	Loading Values	Cronbach's α	AVE	Mean	S.D
Relational Capital	RC1	.685	0.72	0.75	3.57	.93
<u>F</u>	RC2	.783			3.76	.91
	RC3	.742			3.70	.88
	RC4	.780			3.85	.88
Business	BPC1	.661	0.74	0.66	2.16	.97
Capability	BPC2	.704			2.16	.92
	BPC3	.689			2.08	.94
	BPC4	.664			2.07	.93
	BPC5	.680			2.12	.93
	BPC6	.573			2.23	.96
Innovative Performan ce	IP1	.573	0.74	0.70	2.33	1.00
	IP2	.629			2.19	.98
	IP3	.659			2.20	.94
	IP4	.703			2.24	.91
	IP5	.687			2.26	.93
Overall Performan	OP1	.705	0.85	.68	2.21	.96
ce	OP2	.702			2.32	1.01
	OP3	.617			2.1742	.94
	OP4	.573			2.1470	.95
	OP5	.629			2.0848	.93
	OP6	.659			2.1742	.96
	OP7	.703			2.1909	.99
	OP8	.687			2.1636	.96

Kaiser-Meyer-Olkin (KMO) and Barlett's test of Sphericity used to evaluate the suitability of the sample for factor analysis. Hutcheson and Sofroniou, (1999) argue that value of KMO approaches to 1 indicates that pattern of correlation is compressed and application of factor analyses becomes appropriate, however, value approaches to zero indicates that there is large dispersion in the data and application of KMO becomes inappropriate. Table 2 highlights that value of KMO measure is greater than 0.60 and Bartlett's Test of Shpericity is also significant for all the measurement constructs which indicate KMO is greater than 0.70 and Barlett's test of Sphericity is also significant thus specifying that sample is suitable for the execution of factor analysis.

TABLE	2
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Kaiser-Meyer-Olkin (KMO) and Barlett's test of Sphericity

Constructs	Items	KMO Measure of sample adequacy	Bartlett's Test of Shpericity Chi-square
Human Capital	05	.774*	633.645
Structural Capital	06	.805*	727.234
Relational Capital	05	.752*	543.910
Business Process Capability	10	.870*	1529.3255
Innovative Performance	05	.782*	657.835
Overall Performance	08	.875*	2171.6235

*, ** and *** represents the significance level at 0.1%, 0.5% and 0.10% respectively

Kline, (2010) argues that discriminant validity refers to items that are used to measure a constructs unable to evaluate other unrelated constructs. Keeping in view, this study attempts to use Fornell and Larcker's framework, which suggests that AVE should be greater than squared correlation of constructs in order to establish the discriminant validity in the measurement model. Table 3 indicates the results of discriminant validity. The values given in italics are AVE and offdiagonal values denote the squared correlation among the constructs. It is apparent from table 3 that values presented in diagonal i.e. AVE is greater than their respective values; hence measurement model confirms the existence of discriminant validity. Hence both table 1 and 2 indicates the well existence of convergent and discriminant validity for further hypotheses testing.

Discriminant validity							
Constructs	HC	SC	RC	BPC	IP	OP	
HC	0.70						
SC	0.40	0.66					
RC	0.33	0.35	0.75				
BPC	0.28	0.32	0.45	0.66			
IP	0.28	0.32	0.39	0.41	0.70		
OP	0.34	0.36	0.23	0.27	0.41	0.68	

TABLE 3 Discriminant Validity

Table 4 shows the results CFA for overall model fitness. It is obvious that values of absolute, incremental and parsimonious fit measures fall within the cut off values except Normed Fit Index (NFI) which is just below the threshold, however it is still tolerable. Thus table 4 indicates the well fit of the model for further hypotheses testing.

TABLE 4

CFA Results for model Fitness for IC Driven Performance

Fit Indices	Actual Score*	Recommended Values
Absolute fit measures		
χ2/df	2.004	$\leq 2a; \leq 5b$
Goodness of Fit Index (GFI)	0.918	\geq 0.90a; \geq 0.80
Root Mean Square Error of Approximation (RMSEA)	0.039	< 0.08a; < 0.10
Incremental fit measures		
Normed Fit Index (NFI)	0.862	≥ 0.90a

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Fit Indices	Actual	Recommended Values
	Score*	
Adjusted Goodness of Fit (AGFI)	0.901	\geq 0.90a; \geq 0.80b
Parsimonious fit measures		
Comparative Fit Index (CFI)	0.925	≥ 0.90a
Parsimony Goodness-of-Fit Index (PGFI)	0.762	The higher is preferred
Parsimony Normed Fit Index (PNFI)	0.759	The higher is preferred

* Presents the score of actual fit indices of CFA model for IC-driven performance using intermediate variables

Table 5 highlights the results of standardized path coefficients of latent constructs for hypotheses testing. For hypotheses H1 to H3, we have examined the impact of all component of IC on overall performance of pharmaceutical sector. Results show that HC, SC and RC positive (β =0.321, β =0.219, β =0.312) and significantly (p<0.01) contributes to overall performance. Similarly, for hypotheses H4 to H6 and for H8 to H10 all the IC's constituents positively and significantly influence the intermediate variables i.e. IP and BPC. Further, intermediate variables are also significantly influence the overall performance of pharmaceutical sector.

TABLE 5

Hypotheses	Direction of Relationship	Estimates	<i>p</i> -value	Remarks
H1	HC →OP	0.483*	< 0.01	Supportive
H2	SC →OP	0.856*	< 0.01	Supportive
H3	RC →OP	0.312*	< 0.01	Supportive
H4	HC →IP	0.611*	< 0.01	Supportive
H5	SC →IP	1.029*	< 0.01	Supportive
H6	$RC \rightarrow IP$	0.284*	< 0.01	Supportive
H7	IP →OP	0.687*	< 0.01	Supportive
H8	HC →BPC	0.568*	< 0.01	Supportive

Standardized Path Coefficients

Hypotheses	Direction of Relationship	Estimates	<i>p</i> -value	Remarks
H9	SC →BPC	0.951*	< 0.01	Supportive
H10	RC →BPC	0.187*	< 0.01	Supportive
H11	BPC →OP	0.710*	< 0.01	Supportive

NOTE: * significant at the 0.01 level (2-tailed)

Legends:

HC=Human Capital

SC=Structural Capital

RC= Relational Capital

IP=Innovative Performance

BPC= Business Process Capability

OP=Overall Performance

IV. MEDIATION ANALYSIS

This study employs the four steps Baron and Kenny (1986) framework to examine the role of intermediate variables i.e. innovative performance and business process capability through structural model using AMOS graphics. For examining the mediating role of intermediate variables, first we have examined the direct effect of independent variables i.e. IC's components on overall performance which is statistically positive $(\beta=0.321, \beta=0.219, \beta=0.312)$ and significant (p<0.01) thus confirms the first assumption of mediation analysis as suggested by (Baron and Kenny 1986). Second, we have evaluated the results of independent variables on both mediating variables and further impact of mediating variables on dependent variable has been examined in order to meet the existence of second and third assumption of Baron and Kenny's typology. Finally, we have measured the indirect effect of independent variables i.e. HC, SC and RC on dependent variable through the intermediate variables in order to set the fourth assumption of Baron and Kenny framework. Table 6 indicates the results of IC's components on overall performance using business process capability and innovative performance as intermediate variables. It is obvious that direct effect of HC, SC and RC (0.483 to 0.264, 0.856 to 0.466 and 0.312 to 0.185 respectively) reduces substantially but still remain significant thus suggesting that business

process capability partially mediates the relationship for IC driven performance. Nevertheless, innovative performance also partially mediates the relationship for IC driven performance because direct effect of IC's components reduces (0.483 to 0.249, 0.856 to 0.411 and 0.312 to 0.185 respectively).

TABLE 6

Indirect Effect of IC's Components on Overall Performance via Business Process Capability and Innovative Performance as a Mediator

Variables	В	S.E	C.R	P-value	Result
HC>OP	.264*	.049	5.407	0.01	Significant
HC>BPC	.541*	.053	10.186	0.01	Significant
BPC>OP	.457*	.070	6.488	0.01	Significant
Variables	В	S.E	C.R	P-value	Result
SC>OP	.466*	.098	4.771	0.01	Significant
SC>BPC	.447*	.079	5.636	0.01	Significant
BPC>OP	.943*	.111	8.485	0.01	Significant
Variables	В	S.E	C.R	P-value	Result
RC>OP	0.185*	0.039	6.548	0.01	Significant
RC>BPC	0.175 *	0.034	5.143	0.01	Significant
BPC>OP	0.131*	0.030	3.683	0.01	Significant
Variables	В	S.E	C.R	P-value	Result
HC>OP	.249*	.048	5.177	0.01	Significant
HC>IP	.482*	.065	7.435	0.01	Significant
IP>OP	.249*	.048	5.177	0.01	Significant
Variables	В	S.E	C.R	P-value	Result
SC>OP	.411*	.092	4.446	0.01	Significant
SC>IP	1.054*	.116	9.045	0.01	Significant

Variables	В	S.E	C.R	P-value	Result
IP>OP	.467*	.071	6.619	0.01	Significant
Variables	В	S.E	C.R	P-value	Result
RC>OP	0.122*	0.032	3.856		Significant
RC>IP	0.065**	0.021	2.704	0.01	Significant at .05
IP>OP	0.165 *	0.031	4.143	0.01	Significant

NOTE: *significant at the 0.01 level (2-tailed), **significant at the 0.05 level (2-tailed)

V. DISCUSSION AND SUGGESTIONS

Literature has extensively discussed the positive connection of IC with firms' performance. However, in ever-changing environment, how does business process capabilities and innovative performance performs a role of a bridge was largely unaddressed in available academic research. Keeping in view as depicted in Figure 1 given in appendix, the findings of the study has achieved the twofold objectives. First, confirms the direct effect of independent variables on dependent and second, tests the indirect effect of independent variables through mediating variables. The results of the study postulate that intellectual capital resources are basically knowledge resources provides a constructive foundation for IC-driven performance through mediating role of business process capabilities and innovative performance. According to knowledge based view (KBV), IC is an important driver for knowledge creation, sharing and value creation process (Marr *et al.*, 2004; Kaplan and Norton, 2004a).

In terms of findings of the study all the components of IC reveal significant and substantial direct effect on performance (β =0.483; β = 0.856 and β = 0.312 respectively). These findings of the study are in align with recommendations of prior research (Grover and Davenport, 2001; Gray and Meister, 2004). Intellectual assets are primarily considered as the raw inputs to get synergies of organization performance. Based on RBV, recent literature on strategic human resource management implies that HC is a strategic valuable resource to provide core competency and sustainable performance (Prahalad and Hamel, 1990; Barney, 2001; Ferratt *et al.*, 2005). It tends to provide competitive strategy if the firms

proper configure it to develop its employment programs (Ferratt *et al.*, 2005). Firms should also need to pay more attention towards embedded structural capital in terms of procedures, routines and systems in order to channeled IC properly into organizational mechanisms. Further, firms need to construct the sound strategic alliances with stakeholders to harvest the superior IC-driven performance. Hence, all three components of IC have different nature of effects on performance, however practitioners need to work together in order to configure the IC to achieve the desired performance outcomes.

In terms of mediating role of business process capability, the results of study suggest that business process capability partially mediates the relationship for IC-driven. This implies that organization with ample intellectual resources tends to strengthen the business process capabilities in terms of outside-in, inside-out and spanning capabilities which further facilitates for IC-driven performance. Like previous studies, this study is also consistent with (Haas and Hansen, 2005; Helfat and Peteraf, 2003), thus indicating business process capability is an important mediator to initiate the IC-driven performance. From a practical perspective, this study implies that premise process capabilities such market demands, effective logistics and manufacturing processes, customer relationship management significantly augment the overall performance as aggregate measure of business process capability which further partially mediates the IC-driven performance. Further, this piece of research suggests that managers should pursue process capability in order to get dynamic competitive positioning as driver of financial and non-financial performance.

With respect of mediating role of innovative performance, this study tends to find that innovative performance partially mediates the relationship for IC-driven performance. The findings of the study highlights that all three components of IC are positive (β =0.611; β =1.029; β =0.284) and significantly related with innovative performance which is consistent with (Martín-de-Castro *et al.*, 2011; Luo, 2003; Widener, 2006). This study implies that in today's rapidly dynamic environment supportive human capital e.g. high of education, expertise and skills tends to improve cognitive abilities of employees which not only improves the entrepreneurial skills and capabilities but also help to govern the business operations smoothly which in turns to increase the innovative performance of organization. Positive connection between relational capital and innovative performance infers that better and closed embedded relations with customers; more specifically with suppliers in terms of manufacturing firms help to improvise new products with minimum cost which tends to influence the innovative performance of firms. These findings are also somehow consistent with (Batjargal, 2003). Finally, in terms of structural capital and innovative performance, the findings of study are consistent with (Bontis, 1998) which submits that strong and unique structural capital in terms of effective routines, procedures and processes provide a potential source for innovative performance which tends to help in achieving superior performance outcomes.

LIMITATIONS AND FUTURE DIRECTIONS

Notwithstanding the substantial theoretical and practical implications, this study also suffers from few limitations which needs to be addressed and calls for future research directions. First, this study is based on cross sectional research design; however, future research needs to be focused on longitudinal data in order to address the time lag effect of data. Second, this study only explores the role of business process capability and innovative performance for IC-driven performance, however with many other context specific variables such as knowledge management strategy (e.g. human oriented and system oriented strategy) and knowledge management capability (e.g. knowledge infrastructure and knowledge process) are not addressed. New research studies need to be focused on these factors in order to get comprehensive understanding of the model.

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APPENDIX

Results of Path Analysis



EXPENDITURE EFFICIENCY AND FISCAL SIZE: AN EMPIRICAL EVIDENCE FROM DEVELOPING ASIAN COUNTRIES

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Abstract. Efficiency of government expenditures has a significant role in achieving macroeconomic policy goals of the government. This research empirically investigates the relationship between efficiency of government expenditures and fiscal size. Performance of government sector in nineteen developing Asian countries is analyzed for six policy areas including administration, health, education, infrastructure, economic performance and economic stability. Results of the study show that medium-sized governments are relatively more efficient in all public policy areas as compared to large-sized government. There is a need to curtail wasteful expenditures and divert government resources towards sectors that strengthen market forces and help to create equal opportunities for the people.

Keywords: Technical efficiency, Public sector performance, DEA double bootstrap, Developing Asia

JEL classification: H21, L25, O53

I. INTRODUCTION

Public sector expenditure is an important source of satisfying collective needs of the society. Government addresses such societal needs by

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providing public goods and services and by correcting market failures. These goods and services are too costly to be delivered by the private sector. If the government does not spend at all, then the provision of basic facilities like infrastructure, security of property rights, and contract difficult. enforcement would become Therefore, government's involvement in economic activity is sometimes indispensable for the economic and social well-being of the masses. According to World Bank (2005), the efficiency of government expenditures has a significant influence on attainment of government's macroeconomic policy goals. Efficiency means the capability of a government to utilize its revenues in the production of goods and services in the best possible manner, to ensure attainment of desired benefits to the economy and enhancement of economic growth.

After the onset of global financial crisis (GFC), many researchers are devising policy frameworks to minimize the effects of business cycles on the economy. Owing to the reduction in world inflation, many economies have followed monetary expansion which aimed at decreasing interest rates to boost economic growth. But paired with exchange rate depreciations, export-oriented countries could not take desired benefits. Provided with a little room for monetary policy in such a situation, a proactive fiscal policy is needed to combat economic fluctuations faced by both developed and developing countries.

Therefore, many economies around the world favor the concept of government expenditures as a tool of fiscal policy for mitigating the harmful consequences of the economic crisis. The main drawback of such countercyclical expansionary stance in fiscal policy is rising fiscal deficits. These rise in deficits can sometimes cause harmful effects especially in case of low income countries. In many developing economies, this issue of high fiscal deficits has given rise to increasing debt to GDP ratio and debt overhang. International financial institutions, like IMF, have introduced fiscal adjustment programs in response to rising debt and fiscal deficits in developing countries.

This scenario has led many researchers to focus on the allocative and distributive usefulness of public expenditures and its role in the stability of the economy. Studies by Mueller (1997), Shleifer and Vishny (1998), and Gwartney *et.al* (2002) concluded that if efficiency of government

funds is improved then the size of government spending will be reduced. Measuring efficiency of government expenditures will, therefore, help to evaluate the usefulness of public spending and allow the optimal use of scarce government resources in such a way that unnecessary rise in public spending could be curtailed, market distortions could be minimized and fiscal deficits could be controlled.

FISCAL POLICY TRENDS IN DEVELOPING ASIA

In context of Asia, it is evident that this economy is significantly influencing the regional and global economic outlook. Although Asia was the first region to come out of global financial and economic turmoil of 2008-09, economic growth of this region is fragile since then. Asian countries are following expansionary stance in fiscal policy and 40 percent of the countries experienced growing fiscal deficits. (ADB, 2016). Two large economies of developing Asia i.e. China and India strongly influenced the growth pattern of the region. China has shifted its policies towards increasing consumption demand while India and Indonesia pursued more investment projects to build capital stock. Republic of Korea has undertaken additional expenditures of \$13 billion in 2015 for job creation and social security services while in 2016 government spending grew at a rate of 3%. In Russia, even though government experienced reduction in revenues due to fall in international oil prices, expenditures in social sector payments and manufacturing sector support were raised. Philippines planned to double the budget allocated for development sectors. Spending was increased to 38%, 12% and 29% in health, education and infrastructure sectors respectively. (ADB, 2016)

In Thailand, \$4 billion stimulus package was introduced by the government which included support for farmers, developmental projects in villages and tax concessions for small-scale industries. (Abdon *et.al.* 2014). In Malaysia and Pakistan, where governments are running high deficits, the countercyclical fiscal stance is crucial. In Pakistan and many other South Asian countries large fiscal deficits are due to low tax buoyancy, therefore, tax net is required to be expanded.

To give a comprehensive overview of the situation, Table 1 reports fiscal deficits experienced by developing Asian countries over the years 2010 to 2015.

TABLE 1

Budget Deficit (%GDP)

Years	2010	2011	2012	2013	2014	2015
Bangladesh	-2.8	-3.6	-3.2	-3.3	-3.1	-3.2
Cambodia	-8.8	-7.6	-6.8	-7.1	-3.8	-2.6
China	-1.7	-1.1	-1.6	-1.9	-1.8	-3.5
Hong Kong	4.2	3.8	3.2	1.0	3.7	0.6
India	-4.8	-5.9	-4.9	-4.5	-4.1	-3.9
Indonesia	-0.7	-1.1	-1.8	-2.2	-2.1	-2.5
Jordan	-2.42	-7.27	-4.24	-3.29	-2.39	-3.19
Kazakhstan	-2.4	-1.9	-2.8	-1.9	-2.7	-2.2
Malaysia	-5.3	-4.7	-4.3	-3.8	-3.4	-3.2
Maldives	-14.4	-6.6	-7.7	-4.1	-2.9	-6.9
Nepal	-1.9	-2.4	-2.0	0.6	0.9	-0.7
Pakistan	-5.9	-6.3	-8.6	-8.1	-4.2	-4.1
Philippines	-3.5	-2.0	-2.3	-1.4	-0.6	-0.9
Sri Lanka	-7.0	-6.2	-5.6	-5.4	-5.7	-7.4
Tajikistan	-7.1	-5.8	-3.1	-4.8	-3.7	-6.5
Vietnam	-2.1	-0.5	-3.4	-5.0	-4.4	-4.6

Source: Asian Development Bank 2016

All the countries except Hong Kong have run high fiscal deficits over time. The highest fiscal deficit was experienced by Sri Lanka i.e.7.4 percent of GDP, while lowest value was of Nepal i.e. 0.7 percent of GDP in 2015. Almost all the countries in this region have reasonable fiscal space, thus there is a need for constant evaluation of fiscal policies in line with the macroeconomic goals set by the government.

This study is aimed at analyzing the performance of government sector in six policy areas i.e. administration, health, education, infrastructure, economic performance and economic stability for selected developing Asian countries. Efficiency of government expenditures is measured through Data Envelopment Analysis (DEA) double bootstrap procedure. This study also intends to highlight the pattern of relationship between government size and its efficiency for the selected panel of countries. This research is very important in context of Asian countries because there is a marked emphasis on the role of fiscal policies in keeping the countries' economies in check after GFC. In many developing Asian countries, IMF has launched fiscal adjustment programs that require phenomenal reduction in government expenditures especially investment spending. It improves the government budgetary position but at the cost of future economic growth. In such a case, measuring efficiency of government expenditures will help to achieve optimal utilization of public resources in achieving high economic growth rates and lower fiscal deficits.

II. LITERATURE REVIEW

The issue of measuring efficiency of government expenditures is gaining marked importance among researchers so that policies can be formulated in line with governments' objective of achieving high and stable economic growth rates.

Grossman *et.al.* (1999) defined technical inefficiency as, given the combination of selected inputs, any level of production which is lower than the maximum output that can be produced. They used Stochastic Frontier Analysis (SFA) to estimate technical inefficiency in local government sector in U.S. They collected samples of 49 local governments in U.S and found that different local governments that are larger in size were having various degrees of technical inefficiencies that changed with estimated degrees of competitive pressures.

Evans *et. al.* (2000) conducted a pioneer study by measuring efficiency of health sector in 191 countries using data over 1993-1997 and employing SFA fixed effect model. They selected mortality and ill health to proxy output indicator and total health expenditure per capita PPP to measure input indicator. The results indicated that Sri Lanka and China had the most efficient health care system among all other developing countries. Oman could significantly reduce child immortality over last 25 years. France on the other hand, had the highest score in provision of health care facilities. Results also revealed that efficiency of health sector is directly related to percentage expenditures on health.

In an investigation, Gupta and Verhoeven (2001) measured government efficiency in health and education sectors for African countries. They selected 37 African Countries and used data from years 1984-1995 to conduct a comparison of efficiency levels among different countries in Africa, and Africa with Asia and western economies. The result portrayed that government spending on health and education was less efficient in Africa as compared to Asia and western countries. They suggested that government should focus on other variables for improvement in education and health input in Africa rather than allocating large budgets in these sectors.

Hollingsworth and Wildman (2003) using the data of World Bank (2000) and Evans *et. al.* (2000) re-estimated country ranking using SFA and DEA to incorporate heterogeneity among member countries. They further divided the countries in OECD and non-OECD economies and concluded that results of OECD countries were relatively more stable as compared to non-OECD countries.

Afonso *et. al.* (2003) computed public sector efficiency scores for 23 industrial countries by developing public sector performance (PSP) and public sector efficiency (PSE) indicators. Their results from PSE index indicated that efficiency for public spending was higher in countries that had low fiscal size and lower in countries that had larger fiscal size. Similar results were obtained with efficiency measurement through non-parametric technique i.e. Fixed Disposal Hull (FDH). They suggested that countries with large public size should reduce the size of government expenditures by almost 35 percent to increase efficiency of public spending. Findings further indicated that EU-15 countries were spending 27 percent more than the countries having higher level of efficiency and almost similar public sector efficiency scores.

In another study, Afonso and Aubyn (2005) addressed the issue of education and health efficiency for OECD economies. They applied two different non-parametric methods FDH and Data Envelopment Analysis (DEA) to generate efficiency scores for their sample of countries. Efficiency scores were found to be higher for some core countries i.e. Japan, Korea and Sweden. Average efficiency scores in health ranged between 0.832 and 0.946 and in education varied between 0.859 and 0.886.

Herrera and Pang (2005) investigated that how efficiently government in developing countries provided its social services. Government spending on health and education was used as inputs. Education sector output was measured by enrollment in primary and secondary schools, completion rates, and scores on learning. For output of health sector, they used life expectancy at birth, rates of DPT and measles immunization and life expectancy (disability adjusted). The results suggested that economies having larger government size, higher wage expenses, larger share of public financing in provision of services, high inequality and foreign aid, performed poorly as indicated by their low efficiency scores.

Afonso *et. al.* (2006) measured efficiency scores of countries entering in EU, EU candidates, and emerging markets. Public sector performance and efficiency scores revealed that those countries having fiscal size of not more than 30 percent were more efficient. They also applied data envelopment analysis (DEA) to measure efficiency scores. DEA scores revealed that Singapore, Korea, Thailand, Cyprus, and Ireland were quite near to the production possibility frontier. Countries having higher ranks used one third of the input utilized by the countries having lower rankings.

Using dataset over 1990-2002 on health, education and infrastructure sectors for 192 countries, Estache *et. al.* (2007) generated efficiency measures for each sector. They maintained that data constraint on output and input on sectoral level was a big hurdle in monitoring the performance of government in different sectors and explained the ways in which this limited data can be employed in most appropriate manner to reach country specific outcomes. Their findings indicated that, on average, high income countries perform better, although not in all the sectors, compared to low income countries. Moreover, they also found that efficiency improved in energy and education sectors during 1990's.

Lavado and Domingo (2015) collected data over the years 1995-2010 to measure health and education sector efficiency in Asian economies. Inputs used were education and health expenditures by the government per country and outputs were measured by primary and secondary completion rates. For education, due to data unavailability, they took average values of data from years 2006 to 2012 and conducted DEA. Results of their analysis indicated that Singapore, Fiji, Vanuatu and Thailand had highest efficiency scores in health sector generated from DEA. Average score of output efficiency was 0.96 percent. In education sector, input oriented DEA scores indicated that sample countries had spent 27 percent more than required to attain that output level. Bangladesh, Cambodia and Nepal were most efficient based on input oriented DEA while Maldives and Samoa were most efficient as per output oriented DEA.

It can be observed from the above review of literature that, there exists a gap on the issue of efficiency measurement in context of developing Asian countries. Furthermore, most of the studies have conducted efficiency analysis for limited policy areas mainly health and education sectors. Present study has conducted the efficiency analysis on a broader perspective by including six important policy areas of the government. In this paper, the latest technique of efficiency measurement i.e. DEA double bootstrap method is employed to measure government sector efficiency in the selected sample of economies. DEA double bootstrap overcomes several drawbacks related to traditional efficiency measurement methods. (Simar and Wilson, 2007).

III. DATA AND METHODOLOGY

DATA

The study uses Annual dataset for 19 developing Asian countries from 1996-2015. These countries include Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Jordan, Kazakhstan, Malaysia, Maldives, Nepal, Pakistan, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Ukraine and Vietnam. Data is obtained from World Development Indicators (WDI) (2016), Penn World Tables (PWT) version 09, World Governance Indicators (WGI) (2016) and Government Finance Statistics (GFS) (2016) published by International Monetary Fund. Detail of variables, interpretation and sources are discussed in Table 2.

TABLE 2

Description of Variables

Policy Area	cy Area Variables				
Administration	Control of corruption				
Administration	Regulatory quality	WGI (2016)			
(Admin)	Rule of law				
Education	Human capital index based on years of				
(Edu)	lu) schooling and returns to education				
Health (Hea)	Infant (mortality inversed values)	WDI (2016)			
ficulti (ficu)	Life expectancy				
Infrastructure (Infra)	Electric power consumption kwh	WDI (2016)			
Economic Performance	c Performance Real GDP growth rate				
(EP)	Unemployment (rate inversed values)				
Economic Stability	Stability of real (GDP coefficient of variation)	WDI (2016)			
(ES)	Inflation (5-year average)				
GEXP	WDI (2016)				
	as % GDP and government investment expenditure as % GDP	GFS (2016)			

Control of corruption, regulatory quality and rule of law are all expressed in percentile ranks which indicates the country's rank among all the countries included in the aggregate indicator. They range between 0 and 100, with 0 corresponding to lowest rank, and 100 to highest rank. Values of infant mortality rate and unemployment rate are inversed and then incorporated into the analysis because these are negative indicators i.e. higher value of these variables exerts negative influence. Government total expenditure is used as the input in efficiency measurement in DEA double bootstrap model.

METHODOLOGY FOR PUBLIC SECTOR PERFORMANCE (PSP) INDEX

First step in the analysis is to construct public sector performance index using six government policy areas. For this purpose, Principal Component Analysis technique is employed. Principal Component Analysis (PCA) is a useful and acknowledged way to reduce many variables in a data set into one or more coherent and uncorrelated factors. Each new component thus obtained is a linear and weighted combination of initial variables. These weights are produced by the Eigen vectors of the correlation matrix or the covariance matrix (in case of standardized data). The factors are ordered in a way that first component accounts for the maximum variation in the original variables. The second component accounts for the maximum possible variation in original variables that could not be accounted for by the first component and so on. There are many assumptions needed to be tested before applying PCA. (see for example; Nardo, Saisana, Saltelli and Tarantola, 2005; Tabachnick and Fedell, 2007; Krishnan, 2010).

General formula to generate scores through PCA, using the first principal component is:

 $PC_{1} = a_{11}(X_{1}) + a_{12}(X_{2}) + a_{13}(X_{3}) + \dots + a_{1n}(X_{n}) - \dots - i$

Where;

 PC_1 is the variable score on first principal component, a_{1n} is the weight of variable 'n' in calculating first principal component and X_n is value of variable 'n'.

METHODOLOGY FOR DEA DOUBLE BOOTSTRAP MODEL

After the construction of PSP index, next step is to measure the efficiency scores. PSP index is used as output while government total expenditure as percentage of GDP is used as input. The study uses smooth bootstrap technique presented by Simar and Wilson (1998, 2000) to generate efficiency scores. It produces DEA bias corrected scores and their confidence intervals with bootstrapping approach.

Output oriented variables return to scales (VRS) model is used to estimate the efficiency scores. Output orientation is adopted because it is assumed that governments want to maximize the level of output given the size of budget. VRS assumption is used because it helps to remove the scale effect of budget which is feared to effect outputs (Banker et al, 1984).

Output oriented DEA estimates for data set (x_i, y_i) for each country can be obtained by solving the following linear programming equation.

$$\widehat{\boldsymbol{\emptyset}}_{vrsi} = max \begin{bmatrix} \boldsymbol{\emptyset} > 0 | \boldsymbol{\emptyset}_i Y_i \leq \sum_{i=1}^n \gamma_i Y_i; \ X_i \geq \sum_{i=1}^n \gamma_i X_i; \\ \sum_{i=1}^n \gamma_i = 1; \ \gamma_i > 0, \ i = 1, \dots, n \end{bmatrix} \text{-----ii}$$

In equation 'ii' above, variables Y, and X represent output and input respectively, while 'i' represents cross sections. $\emptyset_i Y_i$ represents efficient level of output. \emptyset is a scalar while γ_i is a non-negative vector of optimal weights of inputs and outputs. $\widehat{\emptyset}_{vrsi}$ is technical efficiency term. $\widehat{\emptyset}_{vrsi} = 1$ means that country "i" is fully efficient. If $\widehat{\emptyset}_{vrsi} < 1$ then it implies that country is less efficient and needs to increase output given the level of inputs.

IV. RESULTS AND INTERPRETATIONS

RESULTS AND INTERPRETATIONS OF PUBLIC SECTOR PERFORMANCE INDEX

Following the steps discussed in methodology, all the assumptions are tested before applying PCA. (Results will be provided upon request). Scores of PSP index are reported in the table below.

|--|

Average PSP Scores (1996-2015)

Country	Admin	Hea	Edu	Infra	ΕP	ES	PSP	GEXP
Bangladesh	0.409	0.498	0.558	0.449	0.418	0.467	1.119	10.967
Cambodia	0.585	0.409	0.454	0.382	0.461	0.503	1.076	11.512
China	0.493	0.522	0.477	0.410	0.380	0.516	1.118	32.313
Hong Kong	0.703	0.561	0.533	0.695	0.544	0.459	1.414	13.592
India	0.517	0.550	0.475	0.402	0.461	0.429	1.182	17.073
Indonesia	0.502	0.614	0.495	0.437	0.612	0.446	1.334	10.931
Jordan	0.433	0.619	0.483	0.559	0.441	0.318	1.231	29.109
Kazakhstan	0.463	0.660	0.359	0.546	0.453	0.479	1.220	14.455

Country	Admin	Hea	Edu	Infra	E P	ES	PSP	GEXP
Malaysia	0.436	0.539	0.567	0.479	0.485	0.503	1.248	25.220
Maldives	0.538	0.287	0.521	0.431	0.455	0.452	1.145	28.040
Nepal	0.423	0.385	0.513	0.434	0.557	0.416	1.158	14.351
Pakistan	0.493	0.692	0.486	0.518	0.514	0.499	1.306	13.028
Philippines	0.425	0.556	0.486	0.530	0.613	0.434	1.252	13.349
Russian Federation	0.518	0.651	0.432	0.539	0.529	0.511	1.321	20.699
Sri Lanka	0.552	0.753	0.569	0.559	0.551	0.454	1.389	14.393
Tajikistan	0.497	0.590	0.511	0.519	0.620	0.380	1.266	13.597
Thailand	0.433	0.493	0.477	0.504	0.588	0.477	1.222	20.946
Ukraine	0.494	0.634	0.428	0.519	0.574	0.534	1.323	21.352
Vietnam	0.564	0.476	0.521	0.439	0.485	0.434	1.160	13.646

Source: Author's Own Calculations

Table 3 presents scores of PSP and sub-indices averaged over the period of 1996-2015. Detailed results of each year for every country are presented in the table 7 in Appendix A.

First column of the table shows countries of interest. Second, third, fourth, fifth, sixth and seventh columns present the scores of sub-indices administration, health, education, infrastructure, economic performance and economic stability respectively. In eighth column results of PSP index are reported. Higher value of sub-indices and total PSP index corresponds to better performance. In ninth column the values of government expenditure as percentage of GDP are mentioned. Using the values of GEXP, we have divided countries based on government size. Small-sized governments are those having GEXP value less than or equal 10.93%, medium-sized governments are those having GEXP value of greater than 10.96 % and less than 21.62% while large sized governments have GEXP value of 21.62% and above.

It is clear from the table that there is not much variation in the PSP scores across countries with a few exceptions. The highest value is achieved by Hong Kong i.e. 1.41. Sri Lanka (1.38), Indonesia (1.33), Ukraine and Russia (1.32) and Pakistan (1.30) are next to follow. Lowest performing country is Cambodia with a score of 1.07. Among better performing countries, all except Indonesia, have medium size

governments while Indonesia has a small-sized government. It means that outcome and performance of public sector is determined by the size of governments as well. Small and medium-sized governments perform better, on average, as compared to the large-sized governments. These results are consistent with findings of Afonso *et. al.* (2003)

Considering the values of sub-indicators, countries having highest scores are Hong Kong (Administration), Tajikistan (Infrastructure), Sri Lanka (Health and Education), and Ukraine (Economic stability). It is evident from these results that countries having medium-sized governments generate higher efficiency scores in these areas.

To get advantage of the data available, a comparison of countries' performance on total PSP index for years 2008 and 2015 is made. It helps to understand the impact of global recession that took place in year 2008, on government performance in these countries. This comparison is illustrated in Table 4.

	-				
Countries	2008	3	2015		
	GEXP	PSP	GEXP	PSP	
Bangladesh	9.662	1.447	13.380	1.795	
Cambodia	12.665	1.272	12.503	2.026	
China	28.296	1.428	30.085	1.932	
Hong Kong	11.425	1.736	14.180	2.066	
India	17.911	1.369	16.802	1.922	
Indonesia	11.040	1.705	12.272	2.088	
Jordan	28.473	1.673	25.378	1.804	
Kazakhstan	15.588	1.625	14.299	1.870	
Malaysia	23.515	1.338	25.695	2.182	
Maldives	27.804	1.074	33.916	1.699	
Nepal	14.371	1.467	15.898	1.861	
Pakistan	13.643	1.585	14.307	1.931	

TABLE 4

Comparison of PSP Index (2008 and 2015)
Countries	2008	8	20	15
	GEXP	PSP	GEXP	PSP
Philippines	11.356	1.474	14.078	2.149
Russia	21.606	1.713	22.547	1.991
Sri Lanka	21.043	1.703	11.629	1.787
Tajikistan	12.290	1.453	15.778	1.347
Thailand	19.919	1.423	21.968	2.058
Ukraine	20.314	1.832	19.469	1.813
Vietnam	13.705	1.228	13.639	2.033

Source: Author's Own Calculations

Table reveals that almost all the countries have improved on PSP index in year 2015 as compared to year 2008 except Tajikistan and Ukraine. It shows that developing Asian countries are not harshly affected by GFC. Cambodia, Hong Kong, Indonesia, Malaysia, Philippines, Thailand and Vietnam have shown significant improvements over the period. It is also evident that all these countries have increased the size of government to some extent. This increase in expenditures is in line with Asian Development Bank policy implementations. (ADB, 2015).

Tajikistan experienced a decline in PSP value from 1.45 to 1.34. Tajikistan economy is experiencing the effects of recessionary waves in Russia and trade problems with its partners Kazakhstan and China. It has put pressures on government's budgetary positions especially when government is aimed at reducing poverty and unemployment. On the other hand, Ukraine has also shown a deteriorating performance on PSP index. Its value decreased slightly from 1.83 to 1.81 from year 2008 to 2015. Ukraine economy was severely affected by 2008 crisis. It started recovering afterwards but is still facing harsh economic conditions since 2013. This is due to internal political factors and, on external front, strict policy by the trading partner Russia.

INTERPRETATION OF DEA DOUBLE BOOTSTRAP RESULTS

In the final stage, DEA Double Bootstrap model is estimated to calculate efficiency scores. Output was measured by total PSP index calculated in the previous section and input was measured by GEXP. Results of the model estimated by DEA Double Bootstrap technique are presented in following table. The efficiency score lies between 0 and 1. The efficiency scores closer to 1 means higher efficiency while the efficiency scores closer to zero means lower efficiency. Output oriented model implies that by using same level of inputs, different levels of outputs are produced. Therefore, if maximum level of output is generated with given level of inputs, then the efficiency score should be maximum. Mean efficiency score for 1996-2015 for each country are presented in Table 5.

TABLE 5

Average Efficiency Scores (1996-2015)

Countries	DEA	B.C DEA
Bangladesh	0.682	0.625
Cambodia	0.641	0.593
China	0.647	0.614
Hong Kong	0.829	0.784
India	0.697	0.662
Indonesia	0.793	0.748
Jordan	0.736	0.699
Kazakhstan	0.706	0.678
Malaysia	0.760	0.703
Maldives	0.816	0.657
Nepal	0.670	0.636
Pakistan	0.757	0.709
Philippines	0.754	0.694
Russia	0.790	0.730
Sri Lanka	0.888	0.754
Tajikistan	0.793	0.680
Thailand	0.708	0.663
Ukraine	0.794	0.743
Vietnam	0.686	0.644

Source: Author's Own Calculations

First column of the table shows countries of interest. Second column gives DEA scores while third column represents bias corrected DEA scores. Detailed results of DEA bias corrected scores for each year and each country are presented in table 8 of Appendix A. From table above, DEA overestimates coefficients and underestimates the frontier. While bias correction after applying 2500 iteration removes exaggeration (Simar and Wilson, 2007).

It is evident from table 5 that 20-year average Bias corrected scores do not show much variation in the developing Asian countries groups. Highest score is attained by Hong Kong i.e. 0.784 which shows that approximately 21.6% output can be increased by making use of same set of inputs. Hong Kong is followed by Sri Lanka (0.753), Indonesia (0.748), Ukraine (0.743), and Russia (0.730). Lowest score is exhibited by Cambodia i.e. 0.593.

To compare the pre and post GFC impact on public sector efficiency in these countries, a comparison between efficiency scores of years 2008 and 2015 is made. Results are reported in the following table.

		200	8			201	5	
Countries	DEA	B.C DEA	L.B	U.B	DEA	B.C DEA	L.B	U.B
Bangladesh	1.000	0.756	0.707	0.991	0.819	0.810	0.791	0.819
Cambodia	0.695	0.682	0.659	0.694	0.928	0.908	0.883	0.926
China	0.780	0.738	0.703	0.777	0.928	0.903	0.871	0.925
Hong Kong	1.000	0.927	0.877	0.992	0.945	0.931	0.906	0.944
India	0.748	0.736	0.713	0.747	0.905	0.881	0.854	0.903
Indonesia	0.931	0.916	0.887	0.930	0.954	0.943	0.920	0.953
Jordan	0.914	0.894	0.859	0.913	0.900	0.860	0.813	0.897
Kazakhstan	0.887	0.874	0.847	0.887	0.856	0.839	0.816	0.855
Malaysia	0.730	0.687	0.654	0.727	1.000	0.968	0.941	0.993
Maldives	0.587	0.568	0.541	0.585	0.778	0.763	0.741	0.777
Nepal	0.801	0.787	0.761	0.800	0.850	0.840	0.820	0.849

TABLE 6

Average Efficiency Scores (1996-2015)

	r				1			
		200	8			201	5	
Countries	DEA	B.C DEA	L.B	U.B	DEA	B.C DEA	L.B	U.B
Pakistan	0.865	0.849	0.820	0.865	0.884	0.870	0.846	0.883
Philippines	0.890	0.835	0.781	0.883	0.984	0.964	0.937	0.983
Russia	0.935	0.921	0.892	0.935	0.910	0.899	0.877	0.908
Sri Lanka	0.930	0.916	0.888	0.929	0.896	0.844	0.794	0.892
Tajikistan	0.793	0.768	0.731	0.792	0.616	0.606	0.590	0.616
Thailand	0.777	0.748	0.712	0.775	0.942	0.927	0.901	0.941
Ukraine	1.000	0.935	0.892	0.991	0.903	0.866	0.819	0.901
Vietnam	0.671	0.656	0.631	0.670	0.939	0.912	0.886	0.937

Source: Author's Own Calculations

Table 6 indicates mixed results across countries. Bangladesh, Cambodia, China, Honking, India, Indonesia, Malaysia, Maldives, Nepal, Pakistan, Philippines, Thailand and Vietnam have shown improvements in their government expenditures efficiency scores. Significant improvement is observed in Malaysia, Maldives and Vietnam as the efficiency scores improved from 0.69 to 0.96, 0.56 to 0.76 and 0.65 to 0.91 respectively.

Countries like Jordan, Russia, Kazakhstan, Sri Lanka, Tajikistan and Ukraine observed a decline in efficiency scores. The reason could be attributed to the fact that most of the labor force migrates from Kazakhstan, Tajikistan and Ukraine to Russia. Russian economy being badly hit by 2008 GFC and then international oil prices crises in 2013, also harmed the economies of neighboring countries. Inflow of remittance slowed down while development projects by the governments were adversely affected due to high fiscal deficits. In Sri Lanka however, this decline in efficiency scores can be related to the effects of GFC transmitted from U.S. and also to the internal political unrest. It resulted in reduction in capital inflows, high fiscal deficits and piling up of debt stock. Furthermore, recent internal political situation had retarding effects on Sri Lankan economic growth. (Perera, 2014). Economy of Jordan is also facing hard time as it is badly affected by high food and oil price crisis since 2011. Strict conditions in international financial environment also caused decreased capital inflows and high fiscal deficits.

V. CONCLUSION AND POLICY IMPLICATIONS

Performance of government sector in nineteen developing Asian countries is analyzed by considering six policy areas including administration, health, education, infrastructure, economic performance and economic stability. An index of Public Sector Performance (PSP) is constructed which shows that medium-sized governments perform relatively better in all the sectors. Comparison of PSP values also reveal that all the countries except Tajikistan and Ukraine have improved their performance during 2008-2015 period. DEA double bootstrap model is employed to generate government expenditure efficiency scores. The results of the model exhibit that countries having medium-sized governments have better efficiencies. Majority of the countries have improved their efficiency scores over the years 2008-2015 except Sri Lanka and Jordan, and other central Asian developing countries including Russia, Kazakhstan, Tajikistan and Ukraine.

Study concludes that relationship between government size and efficiency of government spending is not very clear if we consider each country separately. Some countries have shown improvements in efficiency score with increase in fiscal size while other countries have shown improvement in efficiency score by reducing the fiscal size. On average, medium-sized governments have shown high efficiency score. Furthermore, on average, central Asian countries have less efficient governments.

Study suggests some important policy recommendations. It is crucial to achieve macroeconomic stability as it has a direct influence on government performance and on the efficiency of government spending. Governments of developing Asian countries especially central Asian region should focus on removing economic fluctuations and achieving lesser unemployment rates. Governments of these countries should allocate more funds towards programs that create employment opportunities for the masses. There should be a proper check on corruption and embezzlement of government resources by officials and bureaucracy, maintenance of law and order and enforcement of property rights to ensure good administration. Moderate spending of governments seems to be key in achieving higher efficiency. Therefore, unnecessary expenditures should be minimized and fiscal space should be created towards sectors that improve infrastructure, enhance human capital and improve economic performance.

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PSP Scores of Countries (1996-2015)

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Cambodia0.2660.3040.3610.4880.6610.6630.6630.6630.6630.6630.6630.6630.6630.6630.6630.6630.6630.66430.7561.301.331.4251.4251.6641.6551.746China0.3150.3860.3810.6310.6320.6310.5730.6030.6420.7750.9001.0151.3001.2371.4011.5461.6541.6541.6731.6461.6551.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6111.7331.6131.7331.6111.7331.6111.7331.6111.7331.6131.7331.6111.7331.7331.6111.7331.7331.6111.7331.73	Bangladesh	0.350	0.442	0.558	0.599	0.686	0.702	0.706	0.746	0.848	1.036	1.253	1.402	1.447	1.490	1.680	1.823	1.450	1.638	1.721	1.795
China0.3150.3860.3820.3430.6080.6420.7350.9061.0151.1901.2851.4051.4281.3911.5111.6461.6551.741Hong Kong0.5380.5360.5360.8120.7370.5310.5361.3511.5361.3511.3801.3751.3971.9182.0162.116Hong Kong0.5380.4490.5320.6710.5440.5730.6030.8890.9701.2971.3551.3691.7361.7321.8711.9711.9731.671Holdonesia0.8890.7120.5730.6810.6030.8890.9701.2311.2491.3561.3691.3751.8711.8731.6731.6731.6731.6731.6731.6731.6731.6731.6731.6731.6731.735Jordan0.2470.2760.4080.8870.8841.0011.2131.4691.5361.5361.5371.8971.6921.6731.735Jordan0.2470.2770.2660.3890.7000.8730.8641.1001.2131.4691.5361.5361.5371.6921.7311.6971.7331.735Jordan0.2470.2780.8680.8700.8661.1031.2851.2491.2651.7461.7461.746Jordan0.2470.2780.8760.8870.8661.1031.2461.2461.26	Cambodia	0.266	0.304	0.361	0.488	0.616	0.663	0.683	0.699	0.791	0.890	1.060	1.147	1.272	1.333	1.425	1.672	1.848	1.928	2.041	2.026
Hong Kong0.5480.5640.6360.8120.7780.5480.5360.8180.7971.5861.5351.3801.7731.5711.9871.9182.0162.116India0.5880.4490.5230.6710.5440.5730.6810.7970.5880.9701.2971.3851.3691.5761.7851.5811.5761.9731.6711.773Jordan0.5880.4490.5230.6600.7390.8810.7970.8810.8751.0870.8750.8761.0911.2811.2491.3561.3761.3761.9821.6921.031Jordan0.4450.5560.4480.5870.8810.8711.2811.1001.2111.2461.3651.3861.5761.7111.8151.9731.735Jordan0.2470.5560.4480.8670.8830.8921.0211.2461.3651.3861.5361.5311.5761.7311.8151.9731.735Malaysia0.2470.5860.4880.8870.8921.0211.1351.4691.5361.5381.5461.7311.5471.5481.5321.5071.5321.7371.5321.7371.5371.7371.9371.5321.7361.7361.7371.5321.7361.7361.7361.7361.7361.7361.7361.7361.7361.7361.7361.7361.7361.7361	China	0.315	0.386	0.382	0.343	0.608	0.642	0.725	0.960	1.015	1.190	1.285	1.405	1.428	1.339	1.511	1.646	1.655	1.746	1.840	1.932
India0.5880.4490.5230.6770.5440.5780.6030.8880.9701.2971.3551.3691.3651.4511.7731.6711.773Indonesia0.8090.7120.3770.6810.7940.8810.7970.8810.8790.9921.1151.2491.3851.5421.7051.7321.8911.9021.9371.9871.936Jordan0.4450.5620.6060.7390.8810.8970.8921.0011.2131.4691.5651.5481.6731.5761.4821.5391.6331.9751.975Jordan0.2470.2770.2660.3890.7000.8920.0211.1181.4691.5651.5651.5481.6921.7311.8151.9731.735Malaysia0.7280.8760.4480.8760.8910.8920.8021.0211.1351.3461.3351.5461.7361.5321.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5321.7371.5321.737Malaysia0.7360.8760.8490.5960.8930.8921.0211.1381.3461.5351.5471.5481.5411.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.5371.537 <th< th=""><th>Hong Kong</th><th>0.548</th><th>0.585</th><th>0.564</th><th>0.636</th><th>0.812</th><th>0.787</th><th>0.926</th><th>1.135</th><th>1.586</th><th>1.637</th><th>1.684</th><th>1.789</th><th>1.736</th><th>1.715</th><th>1.987</th><th>1.918</th><th>2.016</th><th>2.116</th><th>2.041</th><th>2.066</th></th<>	Hong Kong	0.548	0.585	0.564	0.636	0.812	0.787	0.926	1.135	1.586	1.637	1.684	1.789	1.736	1.715	1.987	1.918	2.016	2.116	2.041	2.066
Indomesia 0.809 0.712 0.631 0.739 0.831 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.873 0.875 1.356 1.356 1.376 1.732 1.873 1.576 1.823 1.576 1.633 1.735 1.633 1.735 Wazakhtsina 0.445 0.556 0.498 0.893 0.701 0.893 0.892 1.021 1.135 1.235 1.469 1.565 1.585 1.562 1.748 1.891 1.935 1.576 1.583 1.575 1.531 1.575 1.533 1.575 1.533 1.535 1.533	India	0.588	0.449	0.523	0.677	0.544	0.578	0.603	0.898	0.970	1.297	1.355	1.380	1.369	1.554	1.826	1.733	1.671	1.773	1.930	1.922
Jordan0.4450.5620.6060.7390.8200.8340.8950.9771.2351.3621.3631.5761.4821.5361.5351.6731.576Kazakhstan0.2470.2770.2660.3890.7000.8730.8641.1001.2131.4691.5651.5851.5351.4671.7481.8151.9751.755Malaysia0.7170.2660.3480.6700.8921.0211.1551.2221.1631.3501.3381.2451.6021.7481.8751.9752.333Malaysia0.7180.8750.8760.8490.8970.9320.9440.9590.8820.8820.8821.1631.3501.3381.2451.6731.5751.7111.8151.776Malaysia0.7280.8760.8730.8640.7010.8320.9920.5220.9440.9590.8821.8821.9631.3731.5751.6911.7711.8221.7761.776Malaysia0.4820.8760.5360.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5641.1011.1311.3611.3711.8221.7761.7761.776Malakisan0.4420.5170.5460.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.5630.563 <th>Indonesia</th> <th>0.809</th> <th>0.712</th> <th>0.377</th> <th>0.681</th> <th>0.794</th> <th>0.851</th> <th>0.879</th> <th>0.922</th> <th>1.115</th> <th>1.249</th> <th>1.385</th> <th>1.542</th> <th>1.705</th> <th>1.732</th> <th>1.891</th> <th>1.962</th> <th>1.937</th> <th>1.987</th> <th>2.059</th> <th>2.088</th>	Indonesia	0.809	0.712	0.377	0.681	0.794	0.851	0.879	0.922	1.115	1.249	1.385	1.542	1.705	1.732	1.891	1.962	1.937	1.987	2.059	2.088
Kazatklistan0.2470.2770.2660.3890.7000.8730.8641.1001.2131.4691.5651.5651.4671.7881.8061.7531.7551.757Malaysia0.7280.6560.4480.6870.8900.8921.0211.1551.2221.1631.3501.3381.2451.6921.7111.8151.9752.955Malaysia0.7280.8750.8470.9430.9570.9220.9440.9590.8820.8821.9450.9661.7461.5781.6161.7411.575Malaysia0.7480.8470.9430.5720.9440.9590.8821.9881.2441.3121.4671.5781.5161.7411.748Malaysia0.4480.5400.5400.5960.5520.7480.7350.9061.1151.7061.7351.5461.5781.6101.7411.748Malaysia0.4480.5400.5460.5460.5460.5460.5460.5460.5460.7440.7351.6911.7131.8671.7951.7951.7961.796Malaysia0.5480.5400.5460.5460.5460.5460.5470.5750.9661.1461.5461.7461.7461.7961.7261.796Malaysia0.5480.5400.5460.5460.5460.5460.5470.5750.9661.7161.7471.8761.797 </th <th>Jordan</th> <th>0.445</th> <th>0.562</th> <th>0.606</th> <th>0.739</th> <th>0.820</th> <th>0.834</th> <th>0.895</th> <th>0.977</th> <th>1.285</th> <th>1.362</th> <th>1.396</th> <th>1.548</th> <th>1.673</th> <th>1.576</th> <th>1.482</th> <th>1.589</th> <th>1.632</th> <th>1.623</th> <th>1.767</th> <th>1.804</th>	Jordan	0.445	0.562	0.606	0.739	0.820	0.834	0.895	0.977	1.285	1.362	1.396	1.548	1.673	1.576	1.482	1.589	1.632	1.623	1.767	1.804
Malayisa 0.728 0.656 0.448 0.887 0.890 1.021 1.155 1.222 1.163 1.350 1.338 1.245 1.671 1.815 1.975 1.338 Malalives 0.855 0.878 0.943 0.957 0.922 0.944 0.959 0.882 0.821 1.045 0.986 1.074 0.939 1.522 1.707 1.627 1.532 1.532 1.536	Kazakhstan	0.247	0.277	0.266	0.389	0.700	0.873	0.864	1.100	1.213	1.469	1.565	1.585	1.625	1.467	1.748	1.806	1.753	1.755	1.825	1.870
Maldives 0.855 0.878 0.843 0.956 0.878 0.843 0.956 1.677 1.627 1.532 1.532 1.532 1.532 1.532 1.532 1.536 1.536 1.536 1.536 1.536 1.536 1.536 1.536 1.536 1.536 1.546 1.536 1.736 1.536 1.736	Malaysia	0.728	0.656	0.448	0.687	0.861	0.690	0.892	1.021	1.155	1.222	1.163	1.350	1.338	1.245	1.692	1.711	1.815	1.975	2.119	2.182
Nepal 0.496 0.472 0.356 0.532 0.748 0.731 0.677 1.035 0.962 1098 1.244 1.312 1.467 1.564 1.561 1.741 1.746 Pakistan 0.482 0.543 0.546 0.558 0.657 0.536 0.506 1.118 1.367 1.706 1.875 1.955 1.585 1.585 1.569 1.776 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.735 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1.736 1.795 1	Maldives	0.855	0.878	0.877	0.943	0.957	0.922	0.944	0.959	0.882	0.829	1.045	0.986	1.074	0.999	1.522	1.707	1.627	1.532	1.656	1.699
Pakistant 0.482 0.540 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.546 0.575 0.506 1.004 1.376 1.391 1.376 1.392 1.392 1.326 1.392	Nepal	0.496	0.472	0.356	0.552	0.748	0.731	0.677	1.035	0.962	1.098	1.244	1.312	1.467	1.546	1.578	1.616	1.741	1.746	1.924	1.861
Philippines 0.536 0.638 0.638 0.644 0.677 0.735 0.906 1.024 1.154 1.254 1.448 1.417 1.822 1.778 1.919 2.122 2.126 Russia 0.342 0.517 0.404 0.613 0.831 0.993 1.145 1.260 1.373 1.575 1.601 1.713 1.380 1.865 1.946 1.972 1.965 Russia 0.342 0.514 0.564 0.993 1.214 1.347 1.452 1.561 1.713 1.380 1.897 2.038 2.032 1.992 7.95 Full 0.346 0.514 0.564 0.998 0.931 1.214 1.347 1.452 1.501 1.713 1.380 1.897 2.038 1.932 1.932 1.932 1.932 1.932 1.932 1.932 1.269 1.932 1.269 1.363 1.325 1.269 1.363 1.326 1.325 1.269 <th1.325< th=""> 1.269 1.326<</th1.325<>	Pakistan	0.482	0.463	0.540	0.546	0.596	0.625	0.860	1.118	1.367	1.706	1.875	1.795	1.585	1.699	1.745	1.756	1.707	1.798	1.916	1.931
Russia 0.342 0.517 0.404 0.613 0.833 0.851 1.454 1.260 1.373 1.575 1.691 1.713 1.380 1.865 1.946 1.972 1.965 1.946 1.972 1.945 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 1.245 <t< th=""><th>Philippines</th><th>0.596</th><th>0.638</th><th>0.502</th><th>0.558</th><th>0.684</th><th>0.677</th><th>0.735</th><th>906.0</th><th>1.024</th><th>1.154</th><th>1.254</th><th>1.488</th><th>1.474</th><th>1.417</th><th>1.822</th><th>1.778</th><th>1.919</th><th>2.122</th><th>2.135</th><th>2.149</th></t<>	Philippines	0.596	0.638	0.502	0.558	0.684	0.677	0.735	906.0	1.024	1.154	1.254	1.488	1.474	1.417	1.822	1.778	1.919	2.122	2.135	2.149
SriLanka 0.360 0.514 0.555 0.793 1.214 1.347 1.347 1.451 1.719 1.707 1.897 2.038 2.022 1.932 1.932 Tajikistan 0.664 0.744 0.729 1.037 1.474 1.487 1.503 1.541 1.529 1.432 1.631 1.543 1.325 1.237 1.328 1.341 1.503 1.328 1.329 1.326 1.326 1.326 1.326 1.326 1.326 1.326 1.326 1.328 1.341 1.501 1.318 1.410 1.326 1.328 1.326 1.328 1.328 1.328 1.328 1.328 1.328 1.328 1.328 1.328 1.328 1.384 1.384 1.844 1.844 1.856 1.856 1.856 1.856 1.858 1.856 1.858 1.958 1.958 1.958 1.958 1.958 1.958 1.856 1.884 Thailand 0.652 0.610 0.454 0.567	Russia	0.342	0.517	0.404	0.613	0.833	0.851	0.993	1.145	1.260	1.373	1.575	1.691	1.713	1.380	1.865	1.946	1.972	1.965	1.996	1.991
Tajikistan 0.664 0.744 0.729 1.020 1.202 1.347 1.447 1.487 1.503 1.541 1.529 1.325 1.318 1.431 1.353 1.325 1.325 1.256 1.256 1.256 1.256 1.361 1.351 1.318 1.410 1.356 1.325 1.256 1.258 1.251 1.217 1.212 1.212 1.212 1.212 1.212 1.212 1.212 1.212 1.216 1.341 1.430 1.759 2.046 1.928 Utailend 0.533 0.376 0.584 0.576 0.856 1.021 1.384 1.566 1.762 1.893 1.433 1.410 1.836 1.936 1.936 1.936 1.936 1.936 1.884	Sri Lanka	0.360	0.514	0.565	0.764	0.998	0.931	1.214	1.344	1.327	1.452	1.651	1.719	1.703	1.707	1.897	2.038	2.022	1.932	1.860	1.787
Thailand 0.503 0.376 0.298 0.566 0.702 0.856 0.1025 1.122 1.225 1.270 1.391 1.410 1.830 1.759 2.046 1.928 Ukraine 0.451 0.472 0.463 0.756 0.876 1.139 1.384 1.566 1.762 1.895 1.836 1.931 2.046 1.936 1.884 Ukraine 0.451 0.472 0.453 0.576 0.754 0.867 1.139 1.384 1.566 1.762 1.895 1.836 1.931 2.002 1.956 1.884 Vietnam 0.662 0.600 0.453 0.634 0.687 0.996 1.197 1.184 1.355 1.298 1.697 1.721 1.896 1.665	Tajikistan	0.664	0.744	0.729	1.002	1.202	1.283	1.347	1.474	1.487	1.503	1.541	1.529	1.453	1.318	1.421	1.363	1.325	1.269	1.325	1.347
Ukraine 0.451 0.472 0.464 0.576 0.754 0.867 1.139 1.384 1.566 1.762 1.886 1.931 2.002 1.956 1.884 Vietnam 0.662 0.600 0.453 0.371 0.668 0.756 0.867 0.866 1.197 1.184 1.355 1.298 1.697 1.721 1.896 1.721 <td< th=""><th>Thailand</th><th>0.503</th><th>0.376</th><th>0.298</th><th>0.584</th><th>0.656</th><th>0.702</th><th>0.856</th><th>1.025</th><th>1.122</th><th>1.225</th><th>1.270</th><th>1.391</th><th>1.423</th><th>1.410</th><th>1.830</th><th>1.759</th><th>2.046</th><th>1.928</th><th>1.980</th><th>2.058</th></td<>	Thailand	0.503	0.376	0.298	0.584	0.656	0.702	0.856	1.025	1.122	1.225	1.270	1.391	1.423	1.410	1.830	1.759	2.046	1.928	1.980	2.058
Vietnam 0.662 0.600 0.453 0.371 0.634 0.668 0.726 0.875 0.996 1.197 1.184 1.355 1.228 1.272 1.598 1.697 1.721 1.896 2	Ukraine	0.451	0.472	0.463	0.494	0.576	0.754	0.867	1.139	1.384	1.566	1.762	1.895	1.832	1.386	1.931	2.002	1.956	1.884	1.824	1.813
	Vietnam	0.662	0.600	0.453	0.371	0.634	0.668	0.726	0.875	0.996	1.197	1.184	1.355	1.228	1.272	1.598	1.697	1.721	1.896	2.035	2.033

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TABLE 8 DEA Double Bootstrap Scores (1996-2015)

Bangladeth0.3040.4140.5200.4320.4470.470 <th>Countries</th> <th>1996</th> <th>1997</th> <th>1998</th> <th>1999</th> <th>2000</th> <th>2001</th> <th>2002</th> <th>2003</th> <th>2004</th> <th>2005</th> <th>2006</th> <th>2007</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th>	Countries	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cambodia0.2310.2320.2330.4440.4430.444<	Bangladesh	0.304	0.414	0.520	0.515	0.452	0.497	0.467	0.473	0.559	0.590	0.674	0.723	0.756	0.748	0.861	0.874	0.697	0.760	0.799	0.810
China0.2700.3030.2000.2310.4460.5410.4780.5630.6530.6530.6530.6530.6530.6530.6530.5810.6530.5810.5630.7480.5830.7580.9530.9680.9730.9930.9730.993	Cambodia	0.231	0.282	0.299	0.484	0.373	0.464	0.467	0.445	0.523	0.534	0.672	0.582	0.682	0.682	0.709	0.809	0.890	0.890	0.940	0.908
Hong Kong0.4680.4370.4440.5430.5430.5430.5440.5440.5460.5430.5440.5440.5460.5430.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5440.5460.7430.7460.7120.7360.9310.9310.934	China	0.270	0.303	0.290	0.251	0.408	0.475	0.508	0.628	0.639	0.681	0.690	0.698	0.738	0.739	0.762	0.770	0.791	0.848	0.895	0.903
India0.5070.4240.4370.4940.3640.4240.3640.4250.3440.3650.3410.5650.3410.5650.3410.5630.3410.5630.3410.5630.5360.5410.5630.5410.7120.7160.7120.7360.9390.9310.9310.9310.9330.9310.933	Hong Kong	0.468	0.535	0.476	0.464	0.543	0.581	0.650	0.745	0.952	0.934	0.884	0.886	0.927	0.927	0.972	0.923	0.968	0.977	0.943	0.931
Indomesia0.6920.5110.6350.5360.6130.6050.6510.6050.6510.6710.7720.7760.7900.9940.9360.9350.9310.9340.9350.933	India	0.507	0.424	0.437	0.494	0.364	0.425	0.414	0.566	0.748	0.709	0.746	0.712	0.736	0.736	0.908	0.834	0.804	0.856	0.942	0.881
Jordan 0.384 0.447 0.481 0.542 0.541 0.612 0.545 0.541 0.742 0.745 0.746 0.747 0.746 0.717 0.746 0.717 0.746 0.717 0.745 0.839 0.834 0.834 0.834 0.834 0.834 0.834 0.834 0.834 0.834 0.833 0.839 0.833 0.834 <t< th=""><th>Indonesia</th><th>0.692</th><th>0.581</th><th>0.314</th><th>0.655</th><th>0.536</th><th>0.613</th><th>0.603</th><th>0.605</th><th>0.670</th><th>0.717</th><th>0.706</th><th>0.792</th><th>0.916</th><th>0.916</th><th>0.939</th><th>0.951</th><th>0.934</th><th>0.924</th><th>0.955</th><th>0.943</th></t<>	Indonesia	0.692	0.581	0.314	0.655	0.536	0.613	0.603	0.605	0.670	0.717	0.706	0.792	0.916	0.916	0.939	0.951	0.934	0.924	0.955	0.943
Kazakhstam0.2140.2560.2470.9430.4430.5880.7150.7380.8420.8820.8870.8740.8750.8460.8150.8490.8130.8390Malaysia0.6530.6110.3810.6440.5010.6770.6700.7490.5570.6570.6690.6570.6690.6570.6690.6570.6700.7490.5580.7530.8330.8330.8390.770Malaysia0.6690.7630.6200.8330.6010.3850.4520.5280.5580.7530.8330.8390.8330.8390.8390.8390.8390.8390.8390.8390.8390.8390.8390.8310.8390.8310.8310.8310.8310.8310.8310.8310.8310.8310.9310.9310.9320.731Malatysia0.4160.3560.4140.5010.5650.5710.5690.5710.5690.5780.7830.8320.8310.8330.8310.8320.8310.8310.8310.8310.8310.8310.8310.93	Jordan	0.384	0.447	0.481	0.542	0.547	0.610	0.625	0.641	0.772	0.767	0.750	0.790	0.894	0.894	0.778	0.764	0.771	0.795	0.875	0.860
Malaysia 0.638 0.611 0.331 0.644 0.501 0.573 0.657 0.657 0.657 0.657 0.657 0.657 0.657 0.657 0.657 0.657 0.657 0.573 0.783 0.783 0.771 0.704 0.704 Maldives 0.690 0.753 0.501 0.533 0.442 0.543 0.543 0.733 <	Kazakhstan	0.214	0.256	0.247	0.394	0.443	0.644	0.588	0.715	0.738	0.842	0.824	0.815	0.874	0.874	0.870	0.875	0.846	0.813	0.839	0.839
Malalityes 0.600 0.773 0.620 0.833 0.601 0.383 0.442 0.581 0.667 0.669 0.671 0.507 0.568 0.753 0.832 0.781 0.710 0.733 Nepal 0.412 0.531 0.442 0.587 0.547 0.549 0.571 0.569 0.771 0.569 0.771 0.787 0.787 0.787 0.787 0.787 0.787 0.787 0.787 0.787 0.889 0.880 0.880 0.880 0.880 0.880 0.880 0.880 0.881 0.893 0.913 0.773 <t< th=""><th>Malaysia</th><th>0.638</th><th>0.611</th><th>0.381</th><th>0.644</th><th>0.501</th><th>0.508</th><th>0.627</th><th>0.670</th><th>0.749</th><th>0.657</th><th>0.622</th><th>0.696</th><th>0.687</th><th>0.687</th><th>0.834</th><th>0.823</th><th>0.873</th><th>0.909</th><th>0.969</th><th>0.968</th></t<>	Malaysia	0.638	0.611	0.381	0.644	0.501	0.508	0.627	0.670	0.749	0.657	0.622	0.696	0.687	0.687	0.834	0.823	0.873	0.909	0.969	0.968
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Thailand 0.426 0.301 0.222 0.447 0.488 0.488 0.512 0.870 0.684 0.696 0.713 0.748 0.903 0.888 0.9913 0 Ukraine 0.339 0.378 0.486 0.512 0.917 0.883 0.956 0.955 0.935 0.935 0.948 0.923 0.912 0.912 0 Ukraine 0.339 0.378 0.486 0.524 0.722 0.917 0.883 0.955 0.935 0.935 0.935 0.948 0.923 0.912 0 Ukraine 0.393 0.356 0.355 0.955 0.935 0.935 0.935 0.948 0.942 0.912 0 0 0 0 0 0 0 0 0 0 0 0.925 0.925 0.912 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Tajikistan	0.572	0.596	0.677	0.808	0.764	0.418	0.437	0.541	0.965	0.862	0.828	0.789	0.768	0.768	0.697	0.660	0.627	0.600	0.609	0.606
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	Vietnam	0.569	0.566	0.344	0.338	0.378	0.443	0.486	0.570	0.659	0.681	0.642	0.690	0.656	0.656	0.795	0.822	0.828	0.898	0.942	0.912

CAPITAL ACCOUNT LIBERALIZATION AND ECONOMIC GROWTH: EVIDENCE FROM EMERGING MARKET ECONOMIES

MUHAMMAD ATIQ UR REHMAN AND MUHAMMAD AZMAT HAYAT*

Abstract. Financial globalization has altered the world economic architecture over the past few decades. The economies are liberalizing their financial sectors by reducing government regulations and restrictions on capital flows across borders. The capital account liberalization is a critical policy decision for the Emerging Market Economies (EMEs). This research work aims at exploring the impact of capital account liberalization on economic growth in the 17 emerging economies over the period 1991 - 2015. The generalized method of moments (GMM) system technique is applied using different de facto and de jure measures of capital account openness. The empirical results indicate that only foreign direct investment (FDI) affects economic growth positively and significantly in the EMEs while the coefficients on all the other measures of capital account liberalization remain statistically insignificant. The findings suggest that FDI is the most beneficial and stable capital flow which imports sophisticated techniques of production, promotes a competitive environment, encourages innovations and inventions and hence promotes economic growth in the emerging economies.

Keywords: Capital account liberalization, Economic growth, Foreign direct investment, Generalized method of moments

JEL classification: F36, F15, F21, C23

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I. INTRODUCTION

Financial liberalization has gained substantial importance in the current globalized world. In the quest of exploring its outcomes, the researchers mainly focus on its effects on economic growth. Theoretical literature suggests that the capital account liberalization encourages an efficient allocation of financial resources, induces financial sector development and provides risk diversification opportunities. Recognizing these potential advantages, the policy makers of industrial economies have taken steps towards financial liberalization over the last three decades. Many researchers attribute the efficiency gains in these advanced economies to liberalized capital markets. McKinnon and Shaw (1973) explain that the financial openness would promote economic growth by encouraging investment and capital accumulation. Financial liberalization also puts a favorable impact on productivity due to easier access to profitable investments opportunities and efficient allocation of funds (Kose et al. 2009). In a more sophisticated context, the capital inflows from rich to poor nations may improve the allocative efficiency of investment, alleviate credit constraints and provide lucrative investment opportunities (Acemoglu and Zilibotti, 1997). According to neoclassical viewpoint, the international capital market liberalization transfers capital from capital-abundant to capital-scarce economies. The cheaper capital in low-income economies encourages investment and promotes economic growth. However, a policy prescription of rapid capital account liberalization in economically less developed countries has been controversial. Some economists advocate the benefits of financial liberalization while others point out some potential risks on the basis of past bad experiences of East Asia and Latin America.

Financial globalization gained popularity in the mid-1980s. The financial markets perform a vital role in the development process of an economy by providing information to the agents about optimal allocation of finances and international diversification. However, there are many concerns over financial liberalization in the wake of global financial crunch experienced by different countries around the globe. The previous two decades have witnessed two cases of massive capital flows to emerging markets. The first wave of crisis started in the 1990s and ended rapidly after bringing Asian financial crisis. The recent case is the increased financial flows from industrialized countries to emerging market economies. However, the nature and composition of financial flows are found to be different in both cases. The strategy of minimum restrictions on capital flows has been encouraged on the basis of expected improved allocation of financial resources and better risk diversification possibilities. It is strongly assumed that the liberalization of financial flows benefits developing countries because they are relatively capitalpoor economies with a higher marginal product of capital. However, the increased capital flows may cause currency and financial crises. The 2008 financial crisis gave a jerk to the global financial regulatory setup and a new debate on the costs and benefits of financial openness started. The experience of capital account liberalization in emerging markets provides many opportunities as well as challenges for the economic policy makers. The core objective of this study is to explore the impact of capital account liberalization on economic growth in emerging market economies exclusively.

II. REVIEW OF LITERATURE

The empirical research does not give a clear explanation of the benefits of financial openness in emerging market economies. Many studies suggest a positive association between financial liberalization and GDP growth but several others are unable to discover any significant link. Quinn (1997) utilizes IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) to develop a financial openness index for a large group of developed and developing economies. The empirical results suggest a positive nexus between financial openness and economic growth. Bailliu (2000) finds that capital account liberalization stimulates growth through financial development in case of developed countries. Arteta et al. (2001) discover a more supportive role of financial openness in advanced countries than in developing economies. Bekaert, Harvey, and Lundblad (2001) find that the capital account liberalization affects GDP growth positively in emerging countries. Ross Livine (2001) finds a favorable influence of financial openness on output growth by bringing improvements in domestic financial setup. O'Donnell (2001) points out that the growth impacts of financial liberalization are different in different countries depending on their economic structures and institutional quality. Soto (2003) explores the contribution of capital account liberalization on GDP growth in 72 economies over the period

1985-1996. The empirical results indicate that the foreign direct investment affects GDP growth positively and significantly. Bonfiglioli (2005) examines the effects of financial openness on total factor productivity, investment and GDP growth for 57 economies. He reveals that the capital account liberalization does not significantly influence capital accumulation but it enhances productivity and economic growth. Kose et al. (2006) discover a positive contribution of FDI inflows on output. Klein and Olivei (2008) discover a positive impact of capital market liberalization on economic growth in developed economies. Bekaert, Harvey, and Lundblad (2011) explain that the countries with more financial development or having higher quality institutions experience larger productivity gains from financial liberalization. Gehringer (2015) explores the role of capital account liberalization in promoting GDP growth for the member economies of the European Union. The author finds that the financial market liberalization affects economic growth positively through productivity channel.

On the other hand, various studies do not find any favorable evidence of positive correlation between financial liberalization and growth. Grilli and Milesi-Ferretti (1995) empirically investigate the contribution of financial liberalization in promoting economic growth for a group of 61 countries. Using different measures of financial liberalization, they find no robust correlation between capital controls and GDP growth. Rodrik (1998) empirically studies the finance-growth nexus in 100 developed and emerging economies. He is unable to find any positive and significant influence of financial market liberalization on economic growth. According to Stiglitz (2000), the direct positive influence of financial liberalization on output growth in emerging markets is largely offset by the negative effects of increased macroeconomic volatility, business cycle fluctuations, and financial sector instability. Edwards (2001) examines the role of capital mobility on GDP and total factor productivity growth. He concludes that the countries with sophisticated domestic financial system experience a favorable outcome of financial openness policies on economic growth. Edison, Livine, Ricci, and Slok (2002) find no robust evidence of a positive nexus between financial liberalization and growth. Chinn and Ito (2008) explain that the benefits of financial market liberalization can only be availed if the domestic financial system is supported by a developed and suitably functioning institutional infrastructure. Kim et al. (2012) examine the impact of opening up borders for international capital flows on macroeconomic uncertainty and economic growth for a group of 70 economies from 1960 to 2007. Using foreign assets and liabilities as financial openness measures, they find a negative effect of liberalized financial markets on GDP growth.

The difference in country coverage, sample size, and empirical methodology may be a cause of divergence in empirical findings. Firstly, most of the studies empirically examine the growth effects of capital account liberalization on developed, emerging, and underdeveloped economies under a single panel data setting while the growth dynamics, macroeconomic environment, institutional quality and corporate governance structures are different in these countries depending on the levels of their development. This study aims at fulfilling the dire need to examine the impact of capital account liberalization on economic growth in emerging economies separately.

III. DATA AND EMPIRICAL METHODOLOGY

The study uses panel data set over the period 1991-2015 for 17 major Emerging Economies including Argentina, Brazil, Chile, China, Hungry, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Russia, Thailand, Turkey, Ukraine, and Venezuela. Emerging markets are those markets which have higher expected returns and greater macroeconomic volatility. IMF (2015) classification is used to select the Emerging market economies. The number of countries for empirical analysis is confined to seventeen due to data availability issues. Our study includes the most prominent Emerging market economies like BRIC (Brazil, Russia, India, and China) with other major Latin American emerging countries (Argentina, Chile, Mexico, and Venezuela). The major emerging states of ASEAN (Indonesia, Malaysia, Philippines, and Thailand) are also part of this study. The main economies of emerging Europe (Hungry, Poland, and Ukraine) are also taken into account. The data on real GDP per capita growth, years of schooling, population growth, Govt. expenditure as a share of GDP, life expectancy and trade openness (exports plus imports as a share of GDP) is obtained from the World Development Indicators (WDI) database.

We use different de facto and de jure measures of capital account liberalization. The de facto measures are developed on the basis of actual capital flows realized. Some major de facto measures of financial liberalization include foreign assets, foreign liabilities and FDI as a share of GDP. Being less volatile, the de facto measures are a better representation of financial liberalization in a country. Our de-facto measures of capital account liberalization include total Assets plus liabilities and FDI both expressed as shares of GDP. The data on total Assets plus liabilities comes from the external wealth of nations database by Lane and Milesi-Ferretti. The data on FDI as a share of GDP is obtained from WDI. De jure measures of financial liberalization reflect the intensity of restrictions on financial flows across countries. These measures are based on the AREAER database published by IMF. We use two de jure measures of capital account liberalization including Chin-Ito KAOPEN index and Schindler index. Chin-Ito KAOPEN index represents the extent of capital account openness of an economy with codified restrictions on financial transactions. The value of 0 represents fully restricted and 1 means unrestricted or fully liberalized economy. The data on Chin-Ito KAOPEN index is collected from Chin and Ito (2011) database. Schindler index is obtained from martin Schindler (2015) data set. Schindler's index of capital controls was initially developed for 91 countries. It is coded in binary form with 0 for unrestricted and 1 for restricted. The study uses a panel data set for estimation due to its various advantages over cross sectional data. The previous studies frequently used cross sectional data for the empirical analysis of finance-growth nexus. The estimation of cross-sectional data is able to test permanent growth impact over long-run horizons while typical neoclassical model suggests only temporary growth impacts of financial flows (Henry, 2007). We employ panel data GMM to cope with the criticism by Henry. The GMM technique enables us to control for the country-specific effects and potential endogeneity bias. We start from the following simple growth regression using panel data:

$$Y_{it} = \beta CAL_{it} + \gamma X_{it} + \varepsilon_{it} \quad \dots \dots (I)$$

Where Y_{it} denotes real GDP per capita growth and CAL_{it} represents any measure of capital account liberalization. The vector of control variables is symbolized by X_{it} contains years of secondary schooling as a proxy for human capital, population growth, trade openness, life expectancy, and government expenditure as a share of GDP. In standard growth regressions, initial GDP per capita is included to test the conditional convergence. The subscripts i and t indicate the countries and the time periods under consideration respectively while ε_i indicates an identically and independently distributed (i.i.d) stochastic error term.

The dynamic form of the equation (1) by incorporating timeinvariant country specific effects η_i can be written as:

$$Y_{it} = aY_{it-1} + \beta CAL_{it} + \gamma X_{it} + \eta_i + \varepsilon_{it} \qquad (II)$$

The time-invariant country-specific characteristics can be eliminated by formulating the preceding equation in differences.

$$Y_{it} - Y_{it-1} = a(Y_{it-1} - Y_{it-2}) + \beta(CAL_{it} - CAL_{it-1}) + \gamma(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1})$$

$$\Delta Y_{it} = a\Delta Y_{it-1} + \beta\Delta CAL_{it} + \gamma\Delta X_{it} + \Delta\varepsilon_{it}$$
(III)

The study uses a panel data set from seventeen emerging economies taking five-year non-overlapping averages of all variables for the period of 1991-2015. The cyclicality of data is reduced by using five-year averages of all variables. The dynamic system GMM panel regression on non-overlapping 5-year averages can be written as

$$\Delta Y_{it} = a \Delta Y_{it-5} + \beta \Delta CAL_{it} + \gamma \Delta X_{it} + \Delta \varepsilon_{it} \dots (III')$$

The above-given equation corresponds to system GMM.

The dynamic panel GMM estimator developed by Arellano and Bond (1991) controls for the endogeneity problem due to the inclusion of lagged dependent variable as a regressor. The system GMM was initially introduced by Arellano and Bover (1995) and then fully developed by Blundell and Bond (1998). It is an extended form of difference GMM. It makes an assumption that the first differences of instrumental variables are not correlated with fixed effects. This additional assumption enhances efficiency by introducing more instruments. The original and transformed equations both form a system of equations which is called system GMM. The difference GMM has a tendency to give biased results in small sample estimations with weak instruments, so the system GMM is more efficient and preferable technique. The Hansen test is used to examine the validity of instruments. The autocorrelation is tested by Arellano-Bond test of second order autocorrelation. The theoretical foundations reveal that the explanatory variables, the years of schooling, population growth, life expectancy, trade openness and government spending are not correlated with each other, so the regressions are likely to face no problem of multicollinearity. Robust standard errors are computed to get rid of heteroskedasticity. Following Barro, Mankiw and Sala-i-Martin (1995), we use the initial income to assess the conditional convergence. The real per capita GDP in 1991 is included as initial income. The coefficient on initial income coefficient ($\alpha < 0$) implies the presence of convergence.

IV. EMPIRICAL RESULTS AND FINDINGS

The empirical results for the panel system GMM are presented in Table 1 and Table 2. In addition to system GMM estimator, we also consider OLS and fixed effect methods on non-overlapping five-year intervals for the robustness checks.

TABLE 1

Dependent Variable		Gt	owth Rate Of R	eal GDP Per C	apita	
Method	System	GMM	Fixed H	Effects	OI	<u>_S</u>
Regression	(1)	(2)	(1)	(2)	(1)	(2)
Initial	-1.8361**	-1.3344**	-2.8047*	-1.6290**	-2.3162*	-1.5098*
Income	(0.8002)	(0.6029)	(0.6424)	(0.6557)	(0.6068)	(0.5173)
Schooling	-0.7905	0.4072	0.8595	0.1321	0.6038	0.1028
_	(3.3963)	(2.0617)	(1.8289)	(1.7850)	(1.6425)	(1.6658)
Population	-0.4762	-0.7045	0.1775	-0.6827	-0.1895	-0.7359
Growth	(0.8304)	(.5458)	(0.7545)	(0.5597)	(0.7826)	(0.5692)
Govt.	-1.1101	-3.9885**	-0.2583	-3.5686**	-0.6891	-3.8761**
Expenditure	(1.9139)	(1.6019)	(1.9039)	(1.7449)	(10.9177)	(1.7966)
Life	3.7677**	6.3892*	26.3430*	8.2689	19.1270**	5.7219
Expectancy	(2.6652)	(2.1330)	(9.5036)	(13.6568)	(8.8486)	(9.6148)
Trade	-1.6572	-1.0918	-1.9669	-1.1339**	-1.6326	-1.1082**
Openess	(1.3290)	(0.6666)	(1.3153)	(0.5564)	(1.2941)	(0.5326)
Total	2.8833		3.1076		2.4376	
Liabilities	(2.2019)		(2.5848)		(2.5227)	
+ Asssets						
FDI		1.8439**		1.8855**		1.9134**
		(0.7564)		(0.9565)		(0.8802)
Constant			-92.4372**	-5.7703	-63.405***	4.6026

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Dependent Variable		G	rowth Rate Of R	eal GDP Per C	apita	
Method	System	n GMM	Fixed	Effects	<u>OI</u>	<u></u>
Regression	(1)	(2)	(1)	(2)	(1)	(2)
			(37.0360)	(56.7287)	(34.0506)	(41.0870)
R-Squared			0.32	0.36	0.26	0.33
Observations	85	85	85	85	85	85
Groups	17	17	17	17	17	17
Hansen (p-value)	0.863	0.811				
AB m2 (p-value)	0.192	0.107				

Note: All variables are in log form except real GDP per capita growth and population growth. De facto measures of capital account liberalization including total assets plus liabilities and FDI both as shares of GDP are used. The data sample ranges from 1991 to 2015 with 5-year non-overlapping averages. Robust standard errors are given in parentheses; *, ** and *** indicate significance at 1%, 5%, and 10% level respectively. AB m2 is the Arellano-Bond test for second order autocorrelation.

Table 1 shows the impact of de facto measures of capital account liberalization on real GDP per capita growth. We use two de facto measures including total assets plus liabilities as share of GDP and FDI as a share of GDP. The empirical results obtained by applying system GMM indicate that only the coefficient of FDI is statistically significant with positive sign while other measure, total liabilities and assets as share of GDP remains statistically insignificant. The fixed effects and pooled OLS applied for the robustness checks, also confirm these results. Foreign direct investment inflows nurture growth in emerging economies by bringing in modern techniques of production, improving managerial skills and encouraging competition through the entry of foreign firms. According to Sarno and Taylor (1999), FDI is a long term and stable capital inflow which helps fostering economic growth. The GMM estimates indicate that a one percent increase in FDI to GDP ratio leads to increase real GDP per capita growth by 1.84 percent. The fixed effects and OLS estimates reflect that a one percent increase in FDI to GDP ratio brings 1.88 to 1.91 percent increases in real GDP growth per capita respectively. The negative and significant coefficient on initial income indicates conditional convergence. These findings are similar to Barro (1996), Bonfiglioli (2005), Kose etl. (2008) and many others. The other control variables are the average years of schooling, population growth, government expenditure, life expectancy and trade openness. The coefficient on life expectancy is positive and significant because better health and social facilities make labor more productive and raise output.

The GMM results suggest that one percent increase in the life expectancy leads to increase economic growth by 3.76 to 6.38 percent or vice a versa. The schooling, population growth and trade openness variables enter into regressions as insignificant variables. The Hansen test p-values are greater than 0.10 in each case which indicates that the instruments are correctly specified. The p-values associated with Arellano-Bond test of second order autocorrelation are greater than 0.10 in each case of GMM regression indicating the absence of autocorrelation.

Dependent Variable		Gr	owth Rate Of R	eal GDP Per C	apita	
Method	System	GMM	Fixed I	Effects	<u>OI</u>	<u>_S</u>
Regression	(3)	(4)	(3)	(4)	(3)	(4)
Initial Income	-1.1567 (0.7296)	-1.3915 *** (0.7593)	-2.0993* (0.5912)	-2.2016* (0.8257)	-1.9368* (0.5304)	-2.0425* (0.7513)
Schooling	-0.6139 (3.0586)	-0.8699 (3.1791)	1.1927 (1.5348)	1.0373 (1.5965)	1.0875 (1.3428)	0.9438 (1.4317)
Population Growth	-0.7657 (0.7564)	-0.7608 (0.7792)	-0.2751 (0.7906)	-0.2677 (0.7868)	-0.3548 (0.7456)	-0.3436 (0.7505)
Govt. Expenditure	-2.4419 (1.9487)	-2.1298 (1.9703)	-1.3337 (1.6597)	-1.0715 (1.7570)	-1.6822 (1.6937)	-1.4442 (1.7889)
Life Expectancy	5.0571*** (2.6185)	5.4916*** (2.6898)	28.3296* (9.6858)	28.2571* (10.3250)	24.4029* (8.8086)	24.4012* (9.1638)
Trade Openess	-0.2390 (0.7246)	-0.2324 (0.7697)	-0.5005 (0.4821)	-0.5487 (0.4796)	-0.4565 (0.4710)	-0.4795 (0.4741)
Chin Ito (2006), KAOPEN Index	-0.0239 (0.2256)		-0.1280 (0.2795)		-0.0804 (0.2846)	
Schindler(2009), KA index		-0.4341 (1.6044)		-0.1871 (0.6904)		-0.3323 (1.7505)
Constant			-96.8129** (38.4257)	- 95.7022** (39.4055)	-80.5795** (35.7780)	-79.7408** (35.7661)
R-Squared			0.25	0.25	0.21	0.21
Groups	17	17	17	17	17	17
Observations	85	85	85	85	85	85
Hansen (p-value)	0.898	0.790				
AB m2 (p-value)	0.154	0.159				

TABLE 2

Estimates Using De Jure Measures

Note: All variables are in log form except real GDP per capita growth and population growth. De jure measures of capital account liberalization including Chin &Ito (2006) KAOPEN Index and Schindler (2009) over all restrictions index are used. The data sample ranges from 1991 to 2015 with 5-year non-overlapping averages. Robust standard errors are given in parentheses; * , ** and *** indicate significance at 1%, 5%, and 10% level respectively. AB m2 is the Arellano-Bond test for second order autocorrelation

Table 2 gives estimates of the impact of de jure capital account liberalization on real GDP per capita growth. The de jure measures include Chin & Ito (2006) KAOPEN Index and Schindler (2009) over all restrictions index. The one-step robust system GMM results indicate that the impact of both de jure measures is statistically insignificant. The fixed effects and pooled OLS applied for the robustness checks, also confirm these results. According to Garita and Zhou (2009), de jure measures of financial liberalization are short term capital flows which do not put any significantly favorable impact on the EMEs as they are unstable and bring macroeconomic fluctuations. The de jure measures are criticized because they do not properly reflect the extent of capital account openness. Moreover, these measures are based on numerous restrictions related to foreign exchange transactions that generally don't restrict capital flows. Most notably, de jure measures are unable to reflect the actual degree of financial globalization. So the both de jure measures are found to be statistically insignificant. The other control variables are the initial income, average years of schooling, population growth, government expenditure, life expectancy, and trade openness. The negative and significant coefficient on the initial income indicates conditional convergence. The life expectancy is positive and significant, while schooling, population growth, and trade openness variables generally remain insignificant. The p-values of Hansen test are greater than 0.10 in each case which implies that the instruments are correctly specified. According to Roodman (2006), Hansen test is weaker and not fairly faithful in first step regression. The two-step estimator is efficient and robust to different patterns of heteroskedasticity and crosscorrelation. Hence, the p-values for the Hansen test are reported from the second step. The p-values of Arellano-Bond test for second order autocorrelation are greater than 0.10 indicating the absence of autocorrelation.

V. CONCLUSIONS AND POLICY RECOMMENDATION

Capital account liberalization and its impacts on economic growth have gained considerable concentration of the different interest groups and researchers around the globe. The changing settings of financial architecture worldwide on the basis of financial sector liberalization have made the capital account liberalization the most hotly debated topic among the policy makers. This research work aims at exploring the influence of capital account liberalization on growth in emerging markets. The study empirically analyzes the seventeen major EMEs including Argentina, Brazil, Chile, China, Hungry, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Russia, Thailand, Turkey, Ukraine, and Venezuela. The GMM system technique is applied using different de facto and de jure financial liberalization measures. The fixed effects and pooled OLS are also applied for the robustness checks. The empirical results suggest that only FDI affects economic growth positively and significantly while all the other measures of capital account liberalization remain statistically insignificant. The findings provide useful policy suggestions for the authorities and think tanks of emerging market economies. It is found that the foreign direct investment is a long term and stable capital flow which imports sophisticated techniques of production through technological diffusion, encourages innovations and inventions due to competition and hence enhances economic growth. The financial liberalization policy should be aiming at attracting more and more foreign direct investment to gain the benefits from favorable technological spillovers. The law and order situation should be improved accompanied with stable macroeconomic policies to encourage the foreign investors. The emerging economies should concentrate on the domestic financial sector development to properly reap the benefits of financial liberalization by allocating funds to the most suitable investment opportunities. The hasty liberalization of capital flows with a fragile domestic financial system may be harmful for the emerging market economies. It is imperative for the economic policy makers of emerging and developing countries to adopt specific flexibility in policy by preserving some regulatory space in their own control. The governments should rationally use their regulatory powers of controlling short-term capital flows to avoid macroeconomic fluctuations and financial crisis in emerging market economies.

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