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How Financial Stability Affects Economic Development in South Asia: A Panel data Analysis

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Abstract

This study examines the relationships between economic development and financial stability in five South Asian economies, namely Pakistan, India, Bangladesh, Sri Lanka and Nepal over the period of 1980-2012. Human Development Index (HDI) used to measure economic development is calculated using the goalposts based on south Asian data. While financial stability is measured by constructing an aggregate financial stability index (AFSI) that combines various indicators relating to financial sector development, vulnerability and banking soundness. We employ Pedroni panel cointegration technique to examine long-run relationship between variables. Empirical evidence confirms the long-run relationship between selected variables. Results estimated by employing Fully Modified OLS (FMOLS) show that financial stability is an essential factor for improving the process of economic development in South Asian countries. Causality analysis indicates that economic development Granger causes financial stability in South Asia.

Keywords: Financial stability, HDI, economic development, panel data, South Asia

Introduction

The primary function of financial institutions is the transfer of financial resources from savers to investors by encouraging investment opportunities. A well-developed financial system not only encourages local investment but also attracts foreign investment. The inflow of foreign capital will stimulate domestic economic activities and increase labor demand. It will in turn encourage the exposure of foreign banks' in domestic economy. Further, a stable financial sector reduces the risk of financial crises. The financial crises of 1990s and global crises of 2007 highlighted the importance of financial stability. The achievement of financial stability has become a prominent intermediate target in most countries in order to achieve their ultimate development objectives. Hence, financial sector stability is necessary for the efficient functioning of financial sector, which is indispensable for economic development.

Despite the importance of financial system for the efficient functioning of the economy, academic researchers and policy makers are unable to assign a single definition of financial stability that is universally accepted by specialists. Numerous researchers, for example, Lager (1999), Issing (2003), Schinasi (2004), Allen and Wood (2006), Cerna et al., (2008) and others have used different techniques to measure this issue and to interpret the achieved results in a different way. One of the widely accepted definitions of financial stability is, *a financial system is stable only when it is capable of encouraging the performance of economy and of fighting financial disruptions that arises endogenously or as the result of adverse and unanticipated events* (Schinasi, 2004).

The financial sector of South Asian economies is not much developed like the financial markets of developed countries. However, in recent years, South Asian countries have taken steps to bring their local auditing and accounting standards in line with international accounting standards,

improve technological infrastructure, modernize payment systems and introduce corporate governance guidelines. These reforms increase the stability of financial system (South Asia Economic Report, 2010).

In the past, the economic development of a country was measured by using a single indicator-GDP per capita. Several economists criticized whether GDP is a comprehensive measure to describe the level of economic development or human well-being. In the words of Mahbub UL Haq (1995), "*any measures that values a gun several hundred times more than a bottle of milk is bound to raise serious questions about its relevance for human progress"*. HDI (human development index) which was created by UNDP in 1990 introduced a revolutionary way to reorganize the conventional approach to development. HDI main focus is on education, skill and health of people, it enables people to participate more actively in growth process and share its benefits particularly through employment.

South Asian countries have experienced an unprecedented economic growth since 1990s. It helped in poverty reduction and raised the score of HDI, but a little improvement is shown in the relative ranking of HDI. Table 1 shows the ranking of South Asian countries in terms of HDI over the period 1990 to 2012. India, Pakistan, Bangladesh and Nepal ranked between 119 and 157 in terms of HDI during the above mentioned period. Sri Lanka ranked lies between 75 and 99 during the same period.

Table 1: Ranking of South Asian Countries in terms of HDI: 1990-2012

Year/Country	India	Pakistan	Bangladesh	Nepal	Sri Lanka
1990	123	120	135	145	75
1995	139	138	147	152	97
2000	124	138	145	142	89
2005	128	136	140	142	99
2010	119	125	129	138	91
2011	134	145	146	157	97
2012	136	146	146	157	92

Source: UNDP (1991, 1998, 2000, 2006, 2010, 2011 and 2013) Human Development Report. (The ranking is in the descending order. The ranking for the year 1990 to 2005 is from 173 to 177 countries. The ranking for the year 2010 to 2012 is from 182 to 186 countries.

The purpose of current study is to use financial stability as an input to economic development and examines the impact of financial stability on economic development in long-run by employing Panel data analysis techniques.

The rest of the paper is organized as follows: Section 2 presents a literature review; Section 3 describes material and methods; Section 4 explains empirical results and their interpretation and last Section 5 concludes the empirical findings.

Review of Literature

Schumpeter (1911) was the pioneer who explored the finance-growth nexus by analyzing the importance of finance in economic activities. Mckinnon (1973) and Shaw (1973) recognized the importance of finance in the mobilization of savings and capital accumulation and in turn promoting economic growth. Before Kindleberger (1978), most studies that emphasize the role of financial sector in economic development give importance to the degree of financial development, usually measured in terms of size, depth, openness and competitiveness of financial structure. The efficiency and the stability of financial system did not receive much attention during this period.

Kindleberger (1978) and later Minsky (1992) explained their viewpoint about financial instability that indicated a negative influence of financial sector on economic growth. Minsky (1992) pointed out that financial instability affects the organization of financial sector and consequently, increases the financial costs. An increase in financial costs leads to misallocation of resources and hence the rate of economic growth may suffer. Following Kindleberger (1978) and Minsky (1992), Lindgren et al. (1999) reported that banking crisis significantly drop the economic growth of Asian countries. Kaminsky and Reinhart (1999) conducted a cross-country study on banking crisis and found that output growth and private credit growth fall significantly below normal level during the episodes of banking crisis.

Cheang (2004) found that financial stability has no direct contribution to economic growth of Macao. He further argued that financial system played a significant role in enhancing the economic growth in good years and limiting the scope of business operation in a difficult time period. Luintel et al. (2008) study results explained that financial stability significantly explains growth performance in most developing countries. Guichard & Turner (2008) found the negative effect of financial crises on economic growth in United Sates. Pholphirul (2008) estimated results showed that uncertainty in the financial sector is the major cause of economic vulnerability in Thailand. Empirical results also demonstrated that sound financial sector help to stabilize the economy and decrease the likelihood of economic distress.

Osterholm (2009) results indicated that financial instability slowers the rate of economic growth in Sweden. Forecasting results suggested that economic growth further decline in the next few years due to crises. In another study, Moriyama (2010) found the indirect impact of financial stress on the output growth in the MENA region. In general, the result of the study suggests that global financial stress and the slowdown in economic growth in world advance countries explain about one half of the decline in output growth in the MENA region. Monnin and Jokipii (2010) study results showed that there is a positive association between banking sector stability and economic growth. The results further explain that instability in the banking sector can create uncertainty about future economic growth. Malik and Janjua (2011) empirical findings demonstrate the negative and significant impact of financial stress on economic growth in south Asia.

Methodology

Selection of Variables

Empirical studies have used different indicators to measure the level of development across countries such as human development index (HDI), human poverty index (HPI) and gender development index (GDI). In this study, we consider HDI is an appropriate indicator to measure the level of economic development of a country.

Three different aspects of human development which are covered in HDI namely, life expectancy, education and income level is measured by three indices. These indices are developed for each country according to the following formula:

Life expectancy index, $$I_{Life\ \exp} = \frac{Life\ \exp_{actual} - Life\ \exp_{\min}}{Life\ \exp_{\max} - Life\ \exp_{\min}} \quad (1)$$

Education index, $$I_{Edu} = \frac{\sqrt{MYSI.EYSI}}{CEI} \quad (2)$$

Mean year of schooling index (MYSI) $= \frac{MYS_{actual} - MYS_{\min}}{MYS_{\max} - MYS_{\min}} \quad (2.1)$

Expected year of schooling index (EYSI) $= \frac{EYS_{actual} - EYS_{\min}}{EYS_{\max} - EYS_{\min}} \quad (2.2)$

Income index, $$I_{Income} = \frac{\left[\ln\left(Income_{actual}\right) - \ln\left(Income_{\min}\right)\right]}{\left[\ln\left(Income_{\max}\right) - \ln\left(Income_{\min}\right)\right]} \quad (3)$$

HDI = $$\left(I_{Life\,\exp}^{1/3} . I_{Education}^{1/3} . I_{Income}^{1/3}\right) \quad (4)$$

In the above indices, maximum and minimum values are set in order to transform the index value between zero and one. Maximums are the maximum values in the South Asian country time-series data over the period 1980 to 2012. The minimum values can be considered as subsistence values. The maximum and minimum values (goalposts) from UNDP, human development report (2013) used in the construction of HDI are presented in Table 2

Table 2: Goalposts for the HDI calculation

	Based on Global indicators		Based on South Asian indicators[1]	
Indicator	Maximum	Minimum	Maximum	Minimum
Life expectancy (Year)	83.6 (Japan, 2012)	20	74.1 (Sri Lanka, 2012)	20
Mean year of schooling	13.3 (United States, 2010)	0	10.9 (Sri Lanka, 2012)	0
Expected year of schooling	18.0 (copped at)	0	18.0 (copped at)	0
Combined education index (CEI)	0.971 (New Zealand, 2010)	0	0.912 (Sri Lanka, 2012)	0
GNI per capita (PPP$)	87,478 (Qatar, 2012)	100	5170 (Sri Lanka, 2012)	100

In present study, financial stability is measured by constructing an aggregate financial stability index (AFSI). The aggregate financial stability index (AFSI) is generated by the authors following Illing and Liu (2003), Hanschel and Monnin (2005), Van den End (2006), Rouabah (2007), Morris (2010) and Albulescu (2011). 15 individual indicators are selected for the construction of AFSI for South Asian economies. These indicators are classified into three categories: financial markets, banking market and vulnerability indicators (see Table-3). These mentioned individual indicators are available on a yearly basis. Before combining all the individual indicators into one single aggregate index, it is necessary to be put on a common scale. For this purpose, all individual indicators are normalized so that they have common variance. Various methods are used for normalization such as statistical normalization and empirical normalization. The statistical normalization procedure is used in the present study. After normalization of individual indicators, the next step is to assign weights to individual indicators. Following Van den End (2006), Morris (2010) and Albulescu (2011), the study utilizes the variance equal weighting method for the construction of aggregate index. Figure-1 shows the trends in AFSI for South Asian economies. Negative values of the indices correspond to the periods of financial instability.

[1] HDI calculated from South Asian countries data is used for empirical estimation.

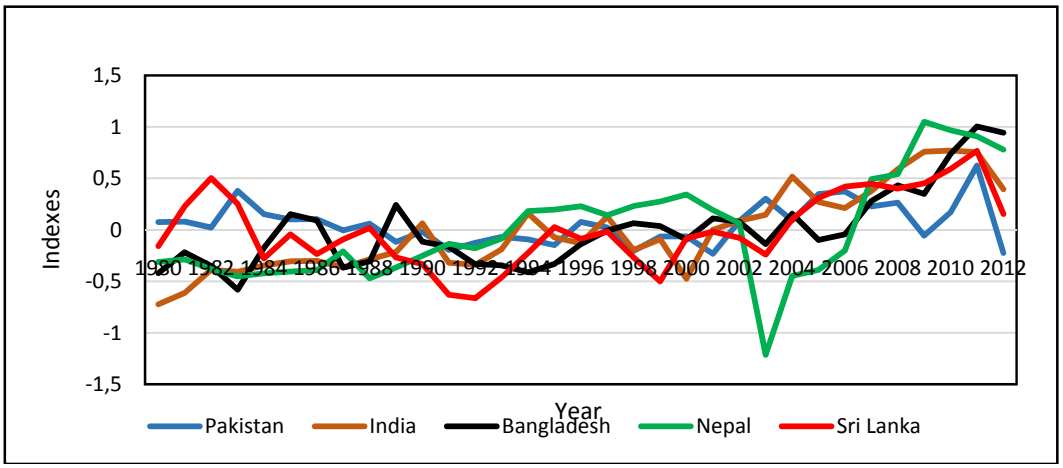

Figure 1. AFSI for South Asian economies

Table-3: Financial Stability Indicators

Individual Indicators		Expected impact on financial stability
(i) Financial market indicators (*fd*)		
Domestic credit to GDP (%)	*dc*	+
Interest rate spreads	*rs*	-
Stock market capitalization to GDP (%)	*smc*	+
(ii) Financial vulnerability indicators (*fv*)		
Fiscal deficit (% of GDP)	*fd*	-
Current account deficit (% of GDP)	*cad*	-
Real effective exchange rate (change)	*reer*	-
Public debt to GDP ratio	*pd*	-
International reserve to import ratio	*irm*	+
Non-government credit to total credit	*ngc*	+
M2 to Foreign exchange reserve ratio	*mfr*	+
M2 multiplier	*mk*	+
(iii) Financial Soundness indicators (*fs*)		
Return on assets	*ra*	+
Bank capital to asset ratio	*bca*	+
Liquid asset to total asset	*la*	+
Bank regulatory capital to risk weighted assets	*brc*	+

Three other variables are added in the regression model in order to check out their possible effect on the HDI. These variables capture investment conditions and political stability of a country. Public sector investment (PUBINV) and private sector investment (PRINV) are used to measure the effect of domestic investment on the HDI. Polity 2 score is used to measure the political stability (PST) of a country. The score ranges from -10 (strongly autocratic) to +10 (strongly democratic).

The information presented above leads us to formulate following econometric model for empirical specification:

$$HDI_{it} = \alpha_0 + \alpha_1 AFSI_{it} + \alpha_2 PUBINV_{it} + \alpha_3 PRINV_{it} + \alpha_4 PST_{ti} + \nu_{it} \quad (5)$$

Where

HDI = Human Development Index is a proxy for Economic development
AFSI = Aggregate Financial Stability Index
PUBINV = Public Investment (% of GDP)
PRINV = Private Investment (% of GDP)
PST = Polity 2 Score is a proxy Political Stability
v = Error Term

Data Sources

The five South Asian Counties namely: Pakistan, India, Bangladesh, Sri Lanka and Nepal are selected for the empirical estimation on the basis of data availability. The time span to be covered in the study is 1980-2012. Data on HDI is collected from UNDP, human development reports (various issues) and author's calculation. Data on financial stability indicators is obtained from World Bank financial structure dataset, International Financial Statistics of IMF, State Bank of Pakistan, Reserve Bank of India, Central Bank of Bangladesh, Central Bank of Sri Lanka and Nepal Rastra Bank. Data on private investment (% of GDP) and public sector investment (% of GDP) is extracted from World Bank, World Development Indicators database. Polity 2 score is obtained from Polity IV project (Marshall and Jaggers, 2013).

Econometric Methods

The first step in panel data analysis is be to check the integrated properties of the underlying variables. LLC test developed by Levin et al., (2002) is applied for this purpose. LLC test imposes homogeneity on the autoregressive coefficient that indicates the presence or absence of unit root problem while the intercept and the trend can vary across individual countries. Recently panel data econometric literature has turned its attention towards testing for and correcting cross-sectional dependence problem. To test for cross-sectional dependence, the Pesaran (2004) and Freidman (1937) cross-sectional dependence (CD) test is employed. The null hypothesis of the test is cross-sectional independence. The results of cross-sectional independence tests are provided in Appendix 2. The null of cross-sectional independence is rejected in our present case. Pesaran (2007) argued that when cross-sectional dependence is high, LLC tests tend to over reject the null hypothesis. For this purpose, we employ the cross-sectional Augmented Dickey-Fuller (CADF) test of Pesaran (2007). CADF test is based on the IPS test, allows for the cross-sectional dependence to be caused by unobservable factors, and is valid for both unbalanced panel and balanced panel.

Pedroni (1999) panel cointegration tests are employed to examine cointegration relationship between variables. Pedroni (1999) uses the following cointegration equation:

$$x_{i,t} = \alpha_i + \rho_i t + \beta_{1i} Z_{1i,t} + \ldots\ldots\ldots + \beta_{mi} Z_{mi,t} + \mu_{it} \quad (6)$$

Where x and Z are assumed to be integrated of order one. Pedroni proposes two sets of test statistics: (i) a panel test based on the within dimension approach (panel cointegration statistics), of which four statistics are calculated: the panel v-, rho-, PP- and ADF statistics; and (ii) a group test based on the between dimension approach (group mean panel cointegration statistics), of three statistics are calculated: the group rho-, PP-, and ADF statistics. Pedroni (1999) further noted that the panel ADF statistics and group ADF statistics have the best small sample properties and thus, provide the strongest evidence of cointegration.

If all the variables are cointegrated, the next step is to estimate the associated long-run cointegration parameters. We estimate the long-run by using fully modified OLS (FMOLS)

developed by Pedroni (2000, 2001). Following Pedroni (2001), FMOLS technique generates consistent estimates in small samples and does not suffer from large size distortions in the presence of endogeneity and heterogeneous dynamics. The panel FMOLS estimators for the coefficient β is defined as:

$$\hat{\beta} = N^{-1}\sum_{i=1}^{N}\left(\sum_{t=1}^{T}(y_{it}-\bar{y})^2\right)^{-1}\left(\sum_{t=1}^{T}(y_{it}-\bar{y})\right)z_{it}^{*} - T\hat{\eta}_i \qquad (7)$$

For robustness check, we have applied Pooled Mean Group (PMG) technique developed by Pesaran et al. (1999). This technique provides consistant estimates of the parameter's averages. In contrast to FMOLS, the PMG estimator method estimates the adjustment dynamics between the short-run and the long-run. The long-run relationship between variables is expected to be identical across countries but the short-run coefficients are expected to be differ across countries. Further, Hausman test is applied to test the null hypothesis of homogeneity in the long-run coefficients.

To test causality, we have employed the panel causality test developed by Dumitrescu and Hurlin (2012). This test is a simplified version of Granger (1969) non-causality test for heterogeneous panel data models with fixed coefficients. It takes into account the two dimensions of heterogeneity: the heterogeneity of regression model used to test the Granger causality and the heterogeneity of the causality relationships. Under the null hypothesis, this test assume that there is no causality relationship for any of the cross-section of the panel. This assumption is called the Homogenous Non-Causality (HNC) hypothesis. The alternative hypothesis is called as Heterogeneous Non-Causality (HENC) hypothesis. Average value of Wald statistics $W_{N,T}^{HNC}$ is proposed to test Homogenous Non-Causality (HNC) hypothesis.

Empirical Results

Table 4 displays the results of IPS and LLC panel unit root tests at level and first difference with constant, and with constant and trend. The results show that each selected series is non-stationary in its level form and stationary in its first difference form in South Asian countries. However, cross-sectional dependence results reported in table 5 indicate that variables exhibit cross-sectional dependence properties. Due to the problem of cross-sectional dependence, Pesaran CIPS test for unit root is applied on each variable. Again all the variables are stationary at first difference (see Table-6). On the basis of these result, we may conclude that all selected variables $(HDI_{it}, AFSI_{it}, PUBINV_{it}, PRINV_{it}, PST_{it})$ are integrated of order one, I (1).

Table-4: LLC Panel Unit Root Test Results

Variables	At level				At 1st Difference			
	η_c	P-value	$\eta_{c,t}$	P-value	η_c	P-value	$\eta_{c,t}$	P-value
LLC Unit Root Test								
HDI_{it}	-0.691	0.356	0.661	0.746	-9.159	0.000	-6.535	0.000
$AFSI_{it}$	1.092	0.862	0.636	0.737	-5.504	0.000	-3.664	0.000
$PRINV_{it}$	0.376	0.648	-1.167	0.121	-7.564	0.000	-6.861	0.000
$PUBINV_{it}$	0.299	0.618	1.140	0.873	-3.320	0.000	-1.947	0.025
PST_{it}	-0.169	0.432	1.794	0.963	-6.900	0.000	-7.613	0.000

Note: η_c represent constant and $\eta_{c,t}$ represent constant and trend.

Table 5: Results of Cross-sectional Dependence Tests

Test statistics	Statistics	P-value	ABS (Corr.)
Friedman	43.19	0.000	0.216
Pesaran	5.675	0.000	0.344

Table-6: CIPS and Unit Root Test Results

Variables	At level				At 1st Difference			
	η_c	P-value	$\eta_{c,t}$	P-value	η_c	P-value	$\eta_{c,t}$	P-value
HDI_{it}	-1.382	0.828	-1.193	0.998	-3.203	0.000	-3.644	0.000
$AFSI_{it}$	-1.895	0.392	-1.607	0.969	-4.038	0.000	-4.021	0.000
$PRINV_{it}$	-0.986	0.971	-1.721	0.942	-4.003	0.000	-4.410	0.000
$PUBINV_{it}$	-1.491	0.754	-1.338	0.995	-3.512	0.000	-4.147	0.000
PST_{it}	-1.534	0.721	-1.724	0.941	-2.740	0.011	-3.252	0.010

Note: η_c represent constant and $\eta_{c,t}$ represent constant and trend.

The results of Pedroni cointegration technique are presented in Table 7. Estimated results of seven statistics show that the null hypothesis of no cointegration cannot be rejected in most cases. Further to confirm the cointegration results, Johansen Fisher panel cointegration technique developed by Maddala and Wu (1999) was applied (Table 8). Trace test indicates 2 cointegrating vectors at 5% level of significance in the presence of trend in VAR equation and 3 cointegrating vector in the absence of time trend in VAR equation. The existence of two or more cointegrating vectors confirms the cointegration relationship among variables. Therefore, we conclude that economic development, AFSI, private investment, public investment and political stability are cointegrated in our selected panel of South Asian countries for the period 1980-2012.

Table-7: Pedroni Panel Cointegration Test Results (Variables: HDI_{it}, $AFSI_{it}$, $PUBINV_{it}$ $PRINV_{it}$, PST_{it})

Models	Statistics	P-value	Statistics	P-value
	No Trend		Trend	
Panel υ-statistic	-1.362	0.913	32.82	0.000
Panel σ-statistic	1.545	0.938	1.024	0.847
Panel ρρ-statistic	1.617	0.947	0.187	0.574
Panel adf-statistic	3.522	0.063	4.518	0.047
Group σ-statistic	1.669	0.952	1.634	0.949
Group ρρ-statistic	1.008	0.843	-0.016	0.493
Group adf-statistic	1.060	0.855	1.004	0.842

Table-8: Johansen Fisher Panel Cointegration Test results (Variables: $HDI_{it}, AFSI_{it}, PUBINV_{it}$ $PRINV_{it}$, PST_{it})

No. of CE(s)	Statistics	P-Value	Statistics	P-Value
	No Trend		Trend	
Trace statistics				
None	76.88	0.000	90.40	0.000
At most 1	38.97	0.000	44.34	0.000
At most 2	17.59	0.062	22.65	0.012
At most 3	10.94	0.362	12.53	0.251
At most 4	14.94	0.134	8.825	0.548
Max Eigen Statistics				
None	45.44	0.000	58.31	0.000
At most 1	30.11	0.000	28.79	0.001
At most 2	13.55	0.194	15.56	0.113
At most 3	8.544	0.576	10.19	0.424
At most 4	14.94	0.134	8.825	0.548

The results of FMOLS (Table 9) show that by taking economic development as dependent variable all coefficients are statistically significant. Estimated results show that financial stability, private investment and political stability are positively related with economic development and implies that one percentage point increase in financial stability, private investment and political stability increases the level of economic development by 0.77 percent, 0.005 percent and 0.006 percent respectively. The sign of public investment is found to be negative which implies that public investment adversely affect the level of economic development in South Asian region. These results support the findings of Holtz-Eakin, (1994); Evans and Karras, (1994); Devarajan, *et al.* (1996), who argued that public investment has a negative impact on economic growth in developing countries because of unproductive and inefficient nature of such investment.

The results of pooled mean group (PMG) along with the results of mean group (MG) and dynamic fixed effect (DFE) are presented in Table 10. PMG results show that financial stability and private investment are positive and significantly related to economic development while the effect of public investment and political stability are found to be negatively and statistically significantly in long-run. These results validate the findings of FMOLS. Hausman test is applied to test the null of homogeneity across countries based on the comparison between PMG and MG estimators. The homogeneity restriction is not rejected jointly for all parameters. Hence, the PMG estimation technique is appropriate for the estimation of long-run coefficients in South Asian countries.

The error correction term (ECT shows adjustment from short-run to long-run dynamics, when there is homogeneity in all variables. The negative sign and its significance at 5% level in all estimated models, result shows that there is an adjustment dynamic from short-run to long-run equilibrium in economic development and financial stability relationship across South Asian countries. In short-run, most of the coefficient are found to be insignificant.

Table-9: FMOLS Results (Dependent Variable: HDI_{it})

Variables	$AFSI_{it}$	$PUBINV_{it}$	$PRINV_{it}$	PST_{it}
Coefficient	0.077	-0.020	0.005	0.006
P-value	0.000	0.000	0.041	0.000

Table 10: PMG, MG and DFE Results (Dependent variable: ΔHDI_{it}) Dynamic specification: ARDL (4, 2, 2, 4, 1)

Variables	PMG		MG		DFE	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Long-run Coefficients						
$AFSI_{it}$	0.394	0.001	0.324	0.036	0.082	0.397
$PRINV_{it}$	0.011	0.000	0.001	0.926	-0.025	0.043
$PUBINV_{it}$	-0.013	0.000	-0.004	0.861	0.008	0.202
PST_{it}	-0.045	0.000	0.014	0.469	0.001	0.773
Short-run Coefficients						
EC_{it-1}	-0.115	0.029	-0.167	0.010	-0.030	0.035
ΔHDI_{it}	-0.100	0.171	-0.492	0.005	-0.076	0.401
ΔHDI_{it-1}	-0.089	0.599	-0.372	0.000	0.071	0.461
ΔHDI_{it-2}	0.072	0.738	-0.239	0.177	0.078	0.80
ΔHDI_{it-3}	0.016	0.936	-0.014	0.936	0.020	0.831
$\Delta AFSI_{it}$	0.002	0.466	-0.002	0.724	0.002	0.329
$\Delta AFSI_{it-1}$	-0.002	0.652	-0.003	0.606	0.001	0.544
$\Delta PRINV_{it}$	-0.001	0.405	0.003	0.005	0.0005	0.870
$\Delta PRINV_{it-1}$	-0.0007	0.387	0.002	0.021	-0.0001	0.706
$\Delta PUBINV_{it}$	0.0002	0.904	0.004	0.005	0.0007	0.329
$\Delta PUBINV_{it-1}$	-0.0002	0.792	0.0005	0.473	0.001	0.079
$\Delta PUBINV_{it-2}$	0.0015	0.336	-0.001	0.236	0.003	0.807
$\Delta PUBINV_{it-3}$	0.0002	0.817	-0.0008	0.275	0.0001	0.982
ΔPST_{it}	0.004	0.149	0.004	0.204	0.0001	0.363
Constant	0.097	0.280	0.146	0.078	0.021	0.006
Hausman Test		6.46		0.167		

The results of Dumitrescu and Hurlin (DH) panel causality test are reported in Table 11. The DH test of causality is applied on first differenced series because all variables are stationary at first difference i.e. I(1). The empirical results of DH causality explain only the evidence of unidirectional causality running from economic development to financial stability in South Asian Region. The results further show the evidence of bidirectional causality between economic

development and private investment and unidirectional causality running from economic development to public investment. The neutral effect exists between economic development and political stability i.e. no causality exists between these variables in South Asian panel.

Table 11: The Result of DH Panel Causality Test at 1st Difference

Direction of Causality	$W_{N,T}^{HNC}$	$Z_{N,T}^{HNC}$	P-Value
$ED_{it} \rightarrow AFSI_{it}$	4.221	4.378	0.000
$AFSI_{it} \rightarrow ED_{it}$	0.386	-0.955	0.339
$PUBINV_{it} \rightarrow ED_{it}$	1.676	0.838	0.402
$ED_{it} \rightarrow PUBINV_{it}$	3.018	2.704	0.007
$PRINV_{it} \rightarrow ED_{it}$	2.538	2.037	0.041
$HD_{it} \rightarrow PRINV_{it}$	4.536	4.815	0.000
$PST_{it} \rightarrow HD_{it}$	0.500	-0.798	0.424
$HD_{it} \rightarrow PST_{it}$	0.909	-0.229	0.818

For sensitivity analysis, we estimated the HDI by setting the goalposts from the south Asian countries data (Table 2) and used these indices for empirical estimation. Results thus obtained were also in line with previous estimated results, and there was no difference in the sign of coefficients and the level of significance. However, only the magnitude of coefficient was slightly different.

Conclusions

The objective of this study is to examine the association between financial stability and economic development in South Asian countries using panel data over the period 1980-2012. Economic development is measured by human development index (HDI) which is a broader measure than economic growth and covers three dimensions of human development such as education, longevity and standard of living. Financial stability is measured by constructing an aggregate financial stability index (AFSI) that combines various indicators relating to financial sector development, vulnerability and banking soundness.

Our results show positive and statistically significant relationship between economic development and financial stability, thus implying that sound and stable financial sector is vital for economic development in South Asian economies over the long-run. The coefficient of public investment is negative and statistically significant in all selected countries, indicating that public sector investment is utilized in inefficient and unproductive investment project. The effect of private investment and political stability on economic development is found to be positive. Causality analysis indicates unidirectional causality running from economic development to financial stability in selected countries. An important policy implications based on the general results of the study is that attempts should be made to more actively and efficiently promote the stability of financial markets, to accelerate its development process and to make it more transparent. Further, there is a need to introduce better micro and macro prudential regulations systems.

References

Albulescu, C.T, 2011.Economic and Financial Integration of CEECs: The Impact of Financial Instability. AUCO Czech Economic Review, 5, 27–45. 2011

Allen, W. and Wood, G.(2006). Defining and achieving financial stability. Journal of Financial Stability, June: 152 172.

Cerna, S., Donath, L., Seulean, V., Herbei, M., Bărglăzan, D., Albulescu, C. and Boldea B, (2008).Financial Stability. Timisoara: West University Publishing House.2008.

Cheang, N. (2004). Financial Stability and Economic Growth of Macao. AMCM Quarterly Bulletin, 11: 67-87.

Dickey D. A., and Fuller W.A., (1979). Distribution of the estimator for auto-regressive time series with a unit root. Journal of the American Statistical Association, 74: 427-431.

Dumitrescu, Elena-Ivona and Hurlin, C. (2012).Testing for Granger non-causality in heterogeneous panels." Economic Modelling. 29(4), 1450-1460

Evans, P., & Karras, G. (1994). Are government activities productive? Evidence from a panel of US states. The Review of economics and statistics, 1-11.

Granger, C. W. J, (1969).Investigating causal relations by econometric models and cross spectral methods. Econometrica. 37, 424- 38.1969.

Guichard, S., and Turner D. (2008). Quantifying the effect of financial conditions on US activity. OECD Economics Department Working Papers, No 635.

Hanschel, E. and Monnin, P. (2005). Measuring and Forecasting Stress in the Banking Sector: Evidence from Switzerland. Basel, Bank for International Settlements, BIS Paper No. 22, 431–449.

Illing M. and Liu Y. (2003). An index of financial stress for Canada. Bank of Canada, Working Paper No 2003–14.

Issing, O., (2003). Monetary and Financial Stability: Is there a Tradeoff? in Monetary Stability. Financial Stability and the Business Cycle: Five Views. BIS Paper No. 18, September, 16-23.

Kaminsky, G. L., and Reinhart, C. M. (1999). The Twin Crises: The Causes of Banking and Balance-Of--Payments Problems. The American Economic Review, 89(3):473–500.

Kindleberger, C. P., (1978). Manias, Crises, and Panics. New York: Basic Books.

Lager, J., (1999). Monitoring Financial System Stability. Reserve Bank of Australia Bulletin, October.

Levin, A., Lin, F., and Chu C, (2002).Unit root tests in panel data: asymptotic and finite-sample properties". Journal of Econometrics. 108, 1-24.

Lindgren, C-J., Garcia, G., and Saal, M., (1996). Bank Soundness and Macroeconomic Policy. Washington: International Monetary Fund.

Luintel, K. B., Khan, M., Arestis,P., & Theodoridis, K. (2008). Financial Structure and Economic Growth. Journal of Development Economics, 86(1), 181–200.

Mahbub ul Haq (1995). Reactions on Human Development. Oxford University Press,New York.

Malik, S., M. and Janjua, Y. (2011). Growth, Employment and Poverty in Current Financial Crisis in India, Pakistan and Bangladesh. Sanei Working Paper Series, No. 11 – 07.

Marshall, M. G., and Jaggers, K. (2013). Polity IV Project: Political Regime Characteristics and Transitions, 1800-2012., Center for Systemic Peace and Colorado State University.

McKinnon, R.I., (1973). Money and capital in Economic development. Washington DC: Brookings Institution.

Minsky, H. P. (1992).The Financial Instability Hypothesis. The Jerome Levy Economics Institute Working Paper No. 74

Monnin, P. and Jokipii, T. (2010). The Impact of Banking Sector Stability on the Real Economy. Swiss National Bank, Switzerland.

Moriyama, K., (2010). The Spillover Effects of the Global Crisis on Economic Activity in MENA Emerging Market Countries—An Analysis Using the Financial Stress Index. . IMF Working Paper No.8. Washington: International Monetary Fund.

Morris, V.(2010). Measuring and Forecasting Financial Stability: The Composition of an Aggregate Financial Stability Index for Jamaica. Bank of Jamaica.

Morris, V. (2010)Measuring and Forecasting Financial Stability: The Composition of an Aggregate Financial Stability Index for Jamaica. Bank of Jamaica. 2010.

Österholm, P., (2009). The Effect on Swedish Real Economy of the Financial Crisis. National institute of economic research, working paper No. 110.

Pedroni, P.(1999).Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. Oxford Bulletin of Economics and Statistics. 61, 653-670. 1999.

Pedroni, P.(2000). Fully modified OLS for the heterogeneous cointegrated panels. In Baltagi, B. (ed.), Advances in econometrics, 15, Non-stationary panels, panel cointegration and dynamic panels. JAI Press, Amsterdam. 93-130.2000.

Pedroni, P.(2001). Purchasing power parity tests in cointegrated panels". Review of Economics and Statistics. 83, 727-731.

Perron, P. (1989). The great crash, the oil price shock and the unit root hypothesis. Econometrica, 57: 1361-1401.

Pesaran, M. H. (2007). A Simple Panel Unit Root Test in the Presence of Cross Sectional Dependence. Journal of Applied Econometrics. 27, 265-312. 2007.

Pesaran, M.H., Shin Y & Smith R.J., (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16: 289-326.

Pholphirul, P.(2008). Financial Instability, Banking Crisis, and Growth Volatility: An Investigation of Bi-Directional Relationship. International Journal of Business and Management, 3(6), 97-110.

Rouabah, A.(2007). Mesure de la vuln´erabilit´e du secteur bancaire luxembourgeois. Luxembourg. Banque centrale du Luxembourg, Working Paper No. 24. 2007.

Schinasi, G.(2004). Defining financial stability. IMF working paper 04/187, Washington DC.

Schumpeter, J.A., (1911). The Theory of Economic Development. Harvard University Press, Cambridge, MA.

Shaw, E.S.(1973).Financial deepening in economic development. New York: Oxford University Press.

South Asia Economic Report. (2010). Financial sector in South Asia: Recent development and challenges. Asian Development Bank.

Van den End, J.W. (2006) Indicator and boundaries of financial stability". DNB Working Paper No 97.