



RESEARCH PAPER

Corruption, Crime, Credit Rating, and Stock Market Development in Pakistan: An Analysis through ARDL Bounds Testing

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This study examines the relationship of corruption (CRPI), crime (CRMI), and credit rating (CR) with stock market development (SMD) of an emerging economy, using the secondary data for a period ranging from 1997Q1 through 2016Q4. The study employs robust ARDL bounds testing to cointegration and error correction model (ECM) for empirical analysis. Findings expose the existence of a negative and significant relationship between CRPI, CRMI, CR, and SMD. The negative and statistically significant coefficient of ECT also ratifies the cointegration estimation of bounds testing. The study contributes in existing literature by examining and reporting the association of some key factors with stock market development of an emerging Asian economy. Bases on results, the study offers certain policy implication and recommendations. It is suggested to control the rising level of corruption and crime in the country. Credit rating also needs proper monitoring and management. Such measures will be helpful in promoting the sustainable economic and financial development of the country.

Introduction

Stock market development (SMD) can be determined with the help of some key indicators, such as stock market capitalization (Asongu, 2012; Aljazeera, Sirop, & Mouselli, 2016), total value traded, turnover ratio, and number of listed companies (Yartey, 2008, 2010) at a particular stock exchange for a particular time period t (end of month/quarter/year). SMD is an integral part of broader financial development which encompasses the development pertaining to stock market and the quantum of domestic credit circulating in an economy, provided by financial institutions as a whole. Broad money is another measure of financial development and few researchers even considered foreign direct investment as a measuring unit for

financial development (Tamazian & Rao, 2010). There are different factors that account for having an impact on SMD in either direction. Corruption is amongst such factors that is severally and negatively damaging the SMD and economic growth in Pakistan. Figure 1 and 2 are depicting the corruption trend in Pakistan, as reported by the international agencies.

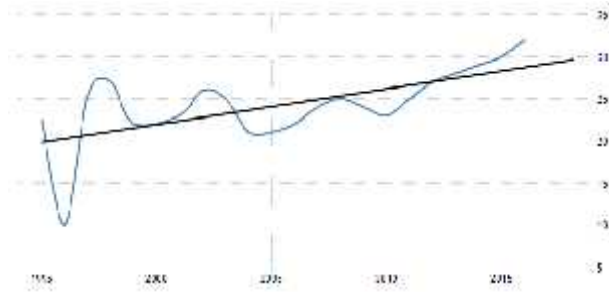


Figure 1 Pakistan Corruption Index

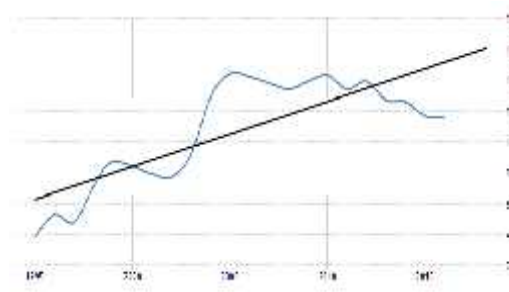


Figure 2 Pakistan Corruption Rank

Source: tradingeconomics.com, Transparency International

Index shows the score of the country out of 100 points, and Pakistan has 32 points at the end of 2016. This is an ever high score in the history of Pakistan while lowest was 10 at the end of 1996. Although, Pakistan corruption index has increased for last 6 years, yet it is ranked as 116 least corruption nations among 175 by the end of 2016.

Concerning crime index, Pakistan was listed at 12 amongst 75 nations by 2012, however, in 2016; it stood at 26 among 117 countries. By the mid of 2017, it ranked 25th among 110 countries across the globe. Higher-level of crimes in a country creates unrest among the public and potential investors feel insecure about investing. This results in an expectation of higher premium in stock returns. Thus, stock market of that country becomes more volatile and unpredictable. Increasing criminal events give rise to uncertainty in the stock market and cause a lower market capitalization, value traded, and turnover ratio. In contrast, the stock markets of countries, which are ranked at the bottom of crime index, are least uncertain for investors. Foreign direct investment, financial and stock market development are expected to be high in such countries when compared to the countries with high crime index.

The credit ratings assigned by rating agencies, such as S&P, Moody's, and Fitch also have varying effects on bond and stock prices. Announcements with a stable/positive outlook assure the improvement of a particular company and country in the area of creditworthiness. However, downgrade news affects stock prices with higher intensity as compared with upgrade outlook, and the effect of such downgrade is translated with a high magnitude relative to that of an upgrade. The response of the stock market to credit rating changes is not clear and straightforward to predict. Such stronger reaction of stock prices in response to

downgrade has a strong long-term impact, little/no short-term effect on the equity market, while for bond market is least responsive. Figure 3 exhibits the Pakistan historical credit rating outlook, assigned by S&P (shown in blue) and Moody's (shown in black). These grades represent the creditworthiness and exposure of default risk associated with the country. The trend for both ratings is almost similar and slight difference is due to the differences in the rating mechanism. By the end of 2016, S&P assigned grade B, which indicates a stable outlook while Moody's at the same time rated Pakistan as B3 with a stable outlook. Historically, Pakistan received the most favorable ratings in 1994-1995 and 2006-07 while worst grade of C by S&P in 1998-99 and Caa2 by Moody's during 2012-14. This trend analysis is presented below.

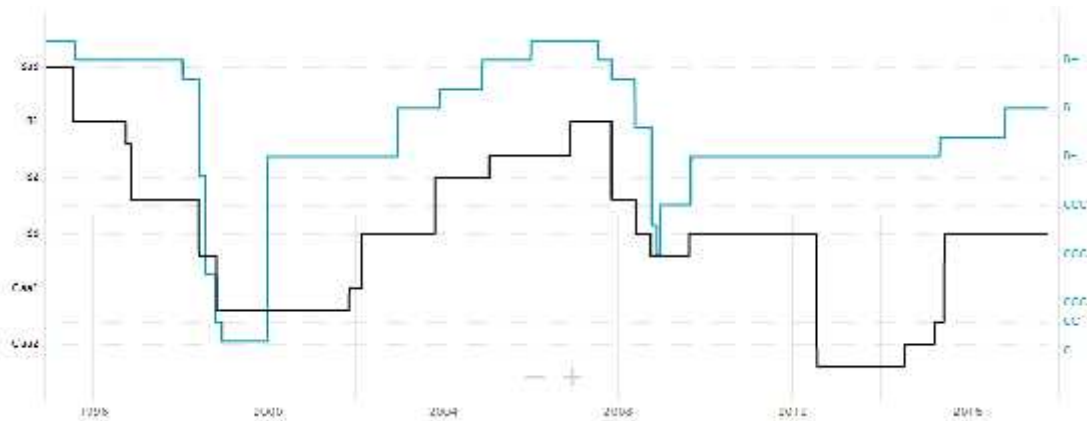


Figure 3 Pakistan Credit Rating (S&P | Moody's)

Source: ieconomics.com | S&P | Moody's

This study is aimed at investigating the dynamic and equilibrium relationship of corruption index, crime index, and credit rating with SMD of an emerging economy. The study applied robust ARDL Bounds testing for cointegration over the quarterly data of 1997 to 2016. In this paper, SMD is chosen as the dependent variable due to three reasons. First is the efficient market hypothesis and speedy reflection of information via stock prices. Second reason is the volatile nature of stock market as it substantially reacts according to the overall economic scenarios (ups and downs). Third reason is that stock market is considered as visage of an economy. The prosperity and economic development is apparently judged by the stock market performance. This study is different from previous studies because it takes into account the country index as predictor with controlling effect of inflation. This country index is composed of corruption index, crime index, and credit rating. All these indicators are pivotal for investors, due to risk attributes associated with them. The stock market does not like uncertainty, and in an uncertain environment a bearish trend is a prevailing sentiment. Such sentiments adversely influence the stock market indicators with a declining market capitalization, value traded, and turnover ratio. The persistence uncertainty leads to

an even worse state. To the best of our knowledge, this is a pioneer effort to consider the indicators of country index as a determinant of SMD in context of an emerging economy, i.e. Pakistan.

Literature Review

Corruption and Stock Market Development

According to Jain (2001), corruption is “an act in which the public office uses its power to gain personal benefits in a contravening manner that violates the rule of law”. Similarly, Transparency International defines corruption perception index (CRPI) as, “the CRPI ranks countries and territories based on how corrupt their public sector is perceived to be, a country or territory’s score indicates the perceived level of public sector corruption on a scale of 0 (highly corrupt) to 100 (very clean)”. Although, there is an extensive debate on economic consequences of corruption, yet no consensus found (Aljazaerli et al. 2016). Rising corruption negatively drives the stock market development of a country (Mo, 2001; Bolgorian, 2011). In contrast, some empirical evidences show that corruption greases the wheels of an economy and it has a positive impact on stock market development (Pinheiro, 2010; Wang & You, 2012; Aljazaerli et al. 2016). Likewise, we found arguments supporting the positive influence of corruption on stock market development (Egger & Winner, 2005; Cuervo-Cazurra, 2008). More interestingly, some scholars argued that corruption affects stock market development depending upon the economic standing of a country (De-Rosa, Gooroochurn, & Gorg, 2010; Pinheiro, 2010). The literature is conflicting on the association of corruption and its effect on stock market development. Therefore, it is hypothesized that:

H₁ Corruption negatively affects the stock market development.

Crime and Stock Market Development

Ehrlich (1973) studied the crime index across states of U.S. and found that income inequalities are positively and strongly correlated with the crime rate. It was suggested to study the role of law enforcement agencies and the portion of budget spent on institutions maintaining law and order to avoid social losses. Soares (2004a) observed the underlying determinants of crime and corresponding correlation with per capita income. The study criticized the erroneous claim of criminologists that there is a positive correlation between crime rates and development. Indeed, there are multiple factors that contribute towards such development. Furthermore, the authors found that there is a crime reporting bias in existing literature and development negatively influences the crime rate while income inequality is positively associated with crime rate. Similarly, Soares (2004b) empirically tested the corrected panel data to examine the relationship between crime and economic development. Results show that inequalities positively drive the criminal activities. Other development measures, such as per capita income, may be affected by rising crime rates in short run, yet the magnitude depends upon the type of crime. Kutan

and Perez (2002) took into account 951 political events and 106 kidnapping events from 1996 to 2000 in Columbia to investigate the impact of organized crimes on stock market development. The study found significant volatility in stock returns due to these events, particular crimes like kidnapping. In conclusion, it is believed that increasing crime rate creates uncertainty in the economy, which in turn translates into stock prices and stock return, while resulting in declining prices (Kang & Ratti, 2013). To establish the association of crime and stock market development, it is theorized:

H₂ Rising crime rate negatively influences the stock market development.

Credit Rating and Stock Market Development

The role of credit rating agencies became noteworthy in mitigating the asymmetric information between parties to various contracts, especially growing financial globalization and boosts with Basel-II extended their active role extraordinarily. Some past events, such as financial crisis, witnessed that financial markets are not much volatile when the relative rating is stable; however, an overreaction is observed when creating grades do change. This overreaction often causes an unstable financial environment (Elkhoury, 2008; Huang & Shen, 2015; Lee, Saprizza, & Wu, 2016). Likewise, the impact of rating changes is stronger in case of downgrade announcements comparative to upgrades, while macroeconomic and legal environment of that particular country in illustrating the credit rating transformation as very vital (Lee et al. 2016). According to numerous researchers, importance of credit rating can be judged with its subsequent stimulus on almost all the sectors of economy with active role of conspicuous rating agencies, such as Standard and Poor's, Moody's, Fitch. The ratings established by these agencies forms a better reference to the factual country risk, instead of a simple quantitative statistical approach (Hoti, 2005; Li, Sun, He, Tang, & Xu, 2009; Li et al. 2012). Credit rating offers a significant role for reduction of information asymmetry in the financial markets between insiders and outsiders (Korkeamaki, Poyry, & Suo, 2014), and helps to determine the fair prices for significant economic transactions (Jory, Ngo, & Wang, 2016). It is inferred that the role of credit rating changes is essential and stock market reaction is somehow a reflection of the rating announcements. Thus, we postulate:

H₃ Improved credit ratings stimulate the stock market development.

Inflation and Stock Market Development

Plenty of research is available regarding the impact of inflation on various development indicators (Nelson, 1976; Fama & Schwert, 1977; Tripathi & Kumar, 2014). The multi-dimensional effect of inflation on economic variables has been reported, e.g. changes in savings, investments, and final consumption through changes in real interest rates, rise in living costs, increasing consumption patterns, condensing the size of financial transactions, etc. This multidimensional effect is not absolute as

some studies documented the positive impact of inflation on stock market development (Maysami, Lee, & Hamzah, 2005; Tiwari, Dar, Bhanja, Arouri, & Teulon, 2015) while some researchers reported the negative association of inflation with stock market indicators (Kyereboah-Coleman & Agyire-Tettey, 2008; Tripathi & Kumar, 2014). For further probing the phenomenon, this study hypothesized:

H₄ Inflation undesirably impetuses the stock market development

Material and Methods

Data and Quantification of Variables

Quarterly data of underlying variables for the period of 1997-2016 were obtained from secondary sources, including World Bank, Pakistan Stock Exchange, Transparency International, Trading Economics, Moody's, and CEIC.

Stationarity Testing and Lag Length

The study determined the stationarity properties of variables through Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests (Dickey & Fuller, 1979, 1981) with the help of equation (1), and VAR lag order selection criteria to determine the most appropriate lag in the estimation process.

$$\Delta Y_t = \alpha_0 + \gamma_1 Y_{t-1} + \sum_{j=1}^p \Delta Y_{t-j} + \epsilon_t \quad (1)$$

Where, ΔY_t is the change in variable Y over time t. Y_{t-1} is the value of variable Y at time t-1, α_0 and γ_1 are the coefficients of estimations, and ϵ is error-term, p represents maximum lag length. The null hypothesis assumes existence of unit root in a particular series against the alternative hypothesis of no unit root. Comparing t-statistics with standard df critical values, null hypothesis is accepted when captured t-stat exceeds df critical value; otherwise we reject null and accept the alternative hypothesis. Similarly, in the VAR lag order selection procedure, the maximum lags to be included in a model is determined by the least value (marked by *) of the majority of criteria set.

Test for Multicollinearity

To mitigate the chances of spurious regression, the study applied variance inflation factor (VIF) test that captures the corresponding VIF value for each independent variable taking into consideration the mutual interdependence of underlying variables. VIF uses the following equation:

$$VIF = \frac{1}{1 - R^2} \quad (2)$$

Higher than 5 VIF value indicates the healthy interdependence of that independent variable translated by others which may leads to poor estimation, if continued without replacing that variable.

Cointegration and ARDL Bounds Testing

Cointegration refers to the long-run relationships among several time series variables, which is commonly observed in social sciences. According to Engle and Granger (1987), cointegration is a linear stationary combination of two or more non-stationary time series, interpreted as a long-run equilibrium relationship among the variables. Time series analysis requires determining cointegration, i.e. whether the group of non-stationary times series variables is cointegrated and the changes in respective order of integration in case of policy modifications (Johansen, 1991; MacKinnon, Haug, & Michelis, 1999; Dritsakis, 2004). The inspirational Autoregressive Distributed Lag Model symbolized as ARDL (Pesaro & Shin, 1998) with the extended version as Bounds testing (Pesaran, Shin, & Smith, 2001) has gained much attention among researchers to investigate the long-run equilibrium association among variables. In case of mixed integration order [I(1) and I(0)], ARDL approach provides best estimates (Pesaran & Shin, 1998), in particular, the results are robust for small sample size (Pesaran & Shin, 1998; Haug, 2002). This model is famous among academic scholars (Shahbaz & Lean, 2012; Alimi, 2014; Raza, 2015; Sharif & Raza, 2016; Sharif, Afshan, & Nisha, 2017). For empirical analysis, theoretical relationship between the indicators of country index and SMD is econometrically stated as;

$$SMD_t = \beta_0 + \beta_1 CRPI_t + \beta_2 CRMI_t + \beta_3 CR_t + \beta_4 INF_t + \mu_t \quad (3)$$

ARDL regression equation for the above model can be written as;

$$\begin{aligned} SMD_t = & \beta_0 + \beta_1 CRPI_t + \beta_2 CRMI_t + \beta_3 CR_t + \beta_4 INF_t \\ & + \sum_{t-1}^p \gamma_{SMD} \Delta SMD_{t-1} + \sum_{t-1}^p \gamma_{CRPI} \Delta CRPI_{t-1} + \\ & + \sum_{t-1}^p \gamma_{CRMI} \Delta CRMI_{t-1} + \sum_{t-1}^p \gamma_{CR} \Delta CR_{t-1} \\ & + \sum_{t-1}^p \gamma_{INF} \Delta INF_{t-1} + \mu_t \end{aligned} \quad (4)$$

SMD denotes stock market development, CRPI to corruption perception index, CRMI to crime index, CR to credit rating, INF to inflation, Δ is the difference

operator, p is the optimal number of lags. $H_0: \gamma_{SMD} = \gamma_{CRPI} = \gamma_{CRMI} = \gamma_{CR} = \gamma_{INF} = 0$ assumes that no long-run relationship holds among variables.

Error Correction Model

Further empirical analysis is preceded with the help of error correction model (ECM), presented in equation (5). The sign of error correction term (ECT) must be negative and statistically significant, with a coefficient (ϕ) ranging between zero and one. It denotes the speed of adjustment towards long-run equilibrium after a short-term shock. For this purpose, we use the following equation;

$$\begin{aligned} \Delta SMD_t = & \zeta_0 + \zeta_1 CRPI_t + \zeta_2 CRMI_t + \zeta_3 CR_t + \zeta_4 INF_t + \zeta_4 \sum_{i=1}^p \Delta INF_{t-1} \\ & + \zeta_5 \sum_{i=1}^p \Delta SMD_{t-1} + \zeta_6 \sum_{i=1}^p \Delta CRMI_{t-1} + \zeta_7 \sum_{i=1}^p \Delta CR_{t-1} \\ & + \zeta_8 \sum_{i=1}^p \Delta INF_{t-1} + \phi ECT_{t-1} + \mu_t \end{aligned} \quad (5)$$

ECT_{t-1} represents the error correction term and coefficients ζ_5 to ζ_8 provides the short-run relationship of respective indicators with stock market development while long-run dynamics are shown by coefficient ζ_1 to ζ_4 . ζ_0 captures the intercept and μ_t is the normally distributed standard error.

Empirical Results and Discussion

Although the ARDL approach is applicable irrespective of integration order, yet it is vital to determine integration order to assure that none of the variables is I(2). Table 1 presents ADF results for I(0) and I(1), where SMD, CRPI, CRMI, and INF are non-stationary at the level, however, found stationary at first difference. CR is stationary at I(0) as well as at I(1). Therefore, this mixed integration order suggests that ARDL approach is more suitable for estimation.

Table 1
ADF Test Results of Stationarity

Integration order Variable	Level [I(0)]		1 st Difference [I(1)]	
	t-statistics	Critical value	t-statistics	Critical value
SMD	-1.891	-3.466	-12.309*	-3.466
CRPI	1.380	-1.945	-2.420*	-1.945
CRMI	-2.164	-3.465	-3.465*	-3.429
CR	-1.944*	-1.244	-7.080*	-3.465
INF	-1.271	-2.896	-10.056*	-3.465

* indicates $p < 0.05$, Null hypothesis assumes the non-stationary of data series

After determining the integration level and lag order selection, the next step is to establish a long-run association among variables. Augmented VAR tool helpsto choose appropriate lags to be included in the estimation process. Akaike information criteria (AIC) and Schwarz information criterion (SC) suggested that two lags are appropriate for further estimation. ARDL Bounds testing is then applied for establishing long run relationship and its results are incorporated in Table 2.

Table 2
ARDL Bounds Testing for Cointegration

F-statistics	9.911***	
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
1%	4.29	5.61
Adjusted R-squared	0.75	
F-statistic	13.162***	
Durbin-Watson stat	2.008	

* indicates $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Comparison of computed F-statistics value with Pesaran et al. (2001) indicates the rejection of null hypothesis that holds no cointegration among variables of the study. This implies that variables are cointegrated in the long run even at 1% significance level. Adjusted R-squared shows that our model explains 75% variation in SMD over the study period observed by a set of regressors while F-statistics affirms the model fitness. These statistics indicate that CRPI, CRMI, CR, and INF jointly influence SMD of Pakistan over the long run. This also specifies that improvement in a set of regressors collectively brings 75% variation in SMD and negative change in these indicators poses an equivalent negative change in SMD. Durbin-Watson test points out the absence of autocorrelation problem in the data set. Based on ARDL Bounds testing approach, table 3 is reporting the long run association among variables of the study.

Table 3
ARDL Long Run Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRPI	-0.309	0.083	-3.701	0.004
CRMI	-0.262	0.058	-4.469	0.001
CR	-0.156	0.045	-3.427	0.001
INF	-0.103	0.026	-3.860	0.039
C	0.137	0.045	3.006	0.003

ARDL Bounds test establishes the long-run equilibrium relationship among the underlying variables. The coefficients for all predictors significantly and negatively influenced the SMD. CRPI and CRMI have appeared to be the prominent

determinant of SMD with 31% and 26% negative impact upon SMD over the long run. These findings are in line with Bolgorian (2011) and Mo (2001). Similarly, CR negatively drives the SMD by 15.6%. The controlled variable INF also affected the SMD negatively in long run with 10%. These results imply that an increase in CRPI, CRMI, and INF hampered the SMD. Similarly, downgraded CR also hindered SMD over the long run. After establishing a long-run relationship through ARDL Bounds testing, short run dynamics were examined and its results are presented in table 4.

Table 4
Error Correction Model and Short-Run Dynamics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ CRPI	0.1835	0.090	2.022	0.044
Δ CRMI	-0.191	0.126	-1.516	0.133
Δ CR	-0.146	0.034	-4.309	0.000
Δ INF	-0.183	0.125	-1.4653	0.146
ECT _{t-1}	-0.276	0.068	-4.024	0.000
C	0.170	0.053	3.160	0.002

ECM increments this cointegration relationship via significant and negative sign of error correction term (-0.276). This holds that system corrects its previous period disequilibrium with a quarterly speed of 27.7%. Like long-run coefficients, CRMI, CR, and INF negatively influence SMD in short-run, although it remains significant for CR only. Interestingly, CRPI positively influences the SMD in short run which is consistent with the argument that in developing countries corruption serves as a growth engine (Wang & You, 2012; Aljazaerli et al. 2016). For establishing the multicollinearity among regressors, VIF test was applied and its results are in table 5.

Table 5
Variance Inflation Factors

Variable	Variance	VIF
CRPI	7.735	1.815
CRMI	2.905	1.745
CR	2.601	1.548
INF	7.345	1.393

All the computed VIF values are less than the specified threshold level which demonstrates that set of regressors used in this study are free from multicollinearity problem and estimation is reliable.

Diagnostic and Stability Analysis

There is a wide range of diagnostic and stability tests generally performed in conjunction with the research model, however in support of ARDL Bounds Testing approach of cointegration; normality condition is tested with Jarque-Bera, serial

correlation with Breusch-Godfrey LM Test, heteroskedasticity with Breusch-Pagan-Godfrey Test, stability analysis with Ramsey RESET (T-stat and F-stat), stability and systematic movement with CUSUM and CUSUM square tests. Results of these tests are presented in table 6 and figure 1.

Table 6
Diagnostic and Stability Results

Nature of Test	Test value (p-value.)
Jarque-Bera (Normality)	4.287 (0.117)
Breusch-Godfrey LM Test (Serial Correlation)	2.158 (0.122)
Breusch-Pagan-Godfrey Test (Heteroskedasticity)	1.683 (0.136)
Ramsey RESET Test: t-statistic (Stability)	0.776 (0.439)
Ramsey RESET Test: F-statistic (Stability)	0.603 (0.439)
CUSUM test (Stability)	Stable
CUSUM Square test (Systematic Movement)	Stable and Systematic

$H_{0(a)}$: "Data is normally distributed" [accepted- p-value>0.05]

$H_{0(b)}$: "There is no serial correlation" [accepted- p-value>0.05]

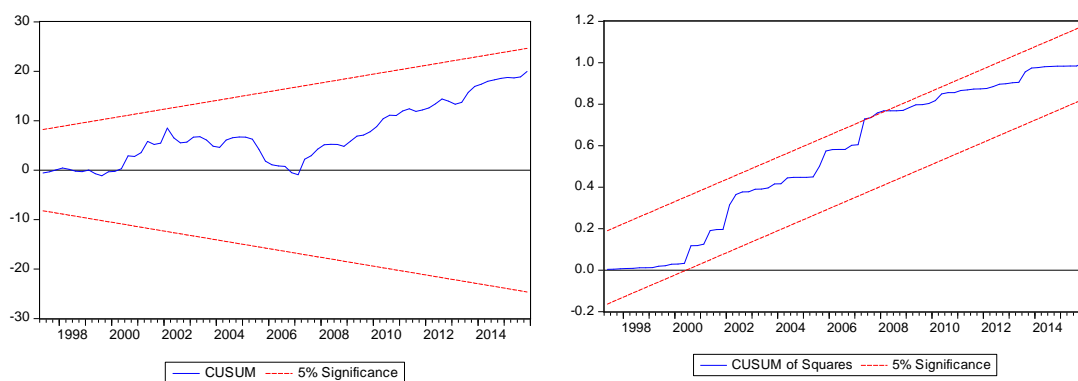
$H_{0(c)}$: "The model is free from heteroscedasticity" [accepted- p-value>0.05]

$H_{0(d \& e)}$: "The model is stable" [accepted- p-value>0.05]

$H_{0(f \& g)}$: "The parameters are stable and systematic" [accepted]

ARDL Bounds Testing approach satisfies all elementary assumptions for reliable estimation such as normality, serial correlation, and heteroscedasticity. Ramsey RESET tests confirm the stability of research model, whereas CUSUM and CUSUM square tests assure the stability and systematic movement of parameters underlying the study.

Figure 1. Stability and Systematic Tests



The left portion of figure 1 exhibits the CUSUM curve. The criteria that assures the stability of parameters is a movement

Right-hand side in figure 1 exhibits the stable and systematic assumption of parameters measured through the

of the blue line within two red lines. If this blue line intersects red lines at any stage, the assumption of stability of parameters is void.

CUSUM of Squares curve. Similar to the CUSUM curve, if CUCUM of Squares curve (blue line) remains in between two red lines the parameters are considered stable and systematic, which validates model reliability.

Conclusion and Policy Implications

This study aimed to investigate the short and long-run relationship between stock market development and some important indicators, namely corruption index, crime index, credit rating, and consumer price index in context of an emerging economy of Pakistan. The analysis period ranges from 1997Q1 through 2016 Q4, using secondary data sourced from CEIC World Bank, and other reliable databases. The study determined the integration order of variables through Augmented Dickey-Fuller test. It was found that all the underlying indicators were stationary at 1st difference, except CR, that was stationary at level. The mixed order of integration guided the selection of ARDL Bounds testing for cointegration, which was preferred over OLS due to its robustness. The optimal lags were selected with the help of AIC, SC, and HQ under Augmented VAR environment. Results of Bounds testing hold that cointegration exists between all the indicators of country index and stock market development in Pakistan. ECM was also applied for examining the restoration of dependent variable to its equilibrium position. For determining the stability of research model, CUSUM, CUSUM square, and Ramsey RESET tests were applied. The diagnostic and stability analysis has fully supported the model's predictability regarding stability and systematic movement of variables over the long run. VIF test statistics endorsed that the indicators are free from multicollinearity problem, and estimation is rational.

The study offers several policy implications and suggestions on the basis of findings. Stock market plays the role of facet and backbone of an economy. Different stock rallies have attracted the intentions of international investors in Pakistan. Future inflows of foreign direct and portfolio investment are also expected. Systematic efforts are needed to overcome the issues of corruption, crime, and inflation in the country for attracting the investors. Corruption remains a chronic and ever-challenging issue in Pakistan. Continuous and stable policies are required to build a positive international image, which would consequently lead the economy on right footings over the long run. The crime rate also needs special and immediate concentration. The rising trend of crimes is alarming as it drives the systematic risk and eventually serving as a source of panic for potential investors and economic wellbeing. S&P credit rating for Pakistan has been improved in last 6-7 years. This is a good sign for the economy because international lenders take into consideration the credit standing of a country. Appropriate measures are needed for curtailing the debt burden, which generally became higher during unstable political conditions. Decision makers and concerned bodies are required to frame policies for sustainable economic environment. Policy makers should keep an eye on inflation and should

attempt to devise policies that may reduce it, or at least control at present level. For sustainable financial and economic development, it is admissible to expedite the mega projects, such as CPEC. Such activities would be helpful to mobilize and utilize the national resources optimally for long-lasting economic prosperity.

The study takes into account Pakistan Stock Exchange for investigating the short and long-run relationship between some indicators of country index and SMD. There is few limitation of the study that may be addressed in future for more comprehensive and concrete evidences. The study has only considered Pakistan Stock Exchange to investigate the association of corruption, crime, and credit rating with stock market development. The analysis may be extended in future to cover the Asian or global stock markets for healthier outcome. Similarly, the comparative study of underdeveloped and developed countries in this context can be interesting. Another possible extension is to add more indicators, formulate an index, and then examine its impact on each economic, financial, and structural development of the countries. Finally, the use of credit ratings issued by JCR-VIS and PACRA for national level empirical analysis is another substantial area that may be addressed in future. Such possible extensions are expected to be helpful for generating more comprehensive and conclusive evidences.

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