Financial Liberalization and Stock Market Behaviour in an Emerging Market – A Case Study of Pakistan

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Abstract

This paper examines the relationship between share prices index and financial liberalization and a set of seven macroeconomic variables in Pakistan for the period 1971-2005 using quarterly time series data. The study uses more comprehensive and recent technique, Bounds test approach to determine the short run and long run linkages between KSE Index and financial liberalization. Findings of the study indicate that GDP is the largest positive determinant of Pakistani stock market in both short run and long run, while inflation is the largest negative determinant in long run. Empirical results also indicate that size of the financial market has positive impact on KSE Index in both long run and short run. Financial liberalization and reforms started in early 1990s, as part of economic reforms has a very strong net effect on the stock market. It means that stock market is too much sensitive and volatile to financial liberalization in emerging economies.

JEL Code: E00, E44

Key words: Financial liberalization, Share prices, Capital Market

I. Introduction

The stock market has traditionally been viewed as an indicator or "predictor" of the economy. Many believe that large decreases in stock prices are reflective of a future recession, whereas bullish trend in stock prices suggest future economic growth. Theoretical reasons for why stock prices might predict economic activity include the traditional valuation model of stock prices of *Miller and Modigliani (1958)* and the "wealth effect." The traditional valuation model of stock prices suggests that stock prices reflect expectations about the future state of the economy, and can therefore predict the economy. The "wealth effect" contends that stock prices lead economic activity by actually causing what happens to the economy.Over the past few decades, the interaction of share returns and the macroeconomic variables has been a subject of interest among academics and practitioners.

It is often argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, the exchange rate and the inflation. *Shiller (1988)* argues that changes in stock prices reflect changes in investor's expectations about future values of certain economic variables that affect directly the pricing of equities. In reviewing the relationship between stock prices and macroeconomic variables both in developed and developed economies the studies have focused on single dimensional approach (using aggregate macroeconomic variables) to explain the determinants of share price, ignoring the financial sector liberalization and reforms. The financial markets of developing countries have been characterized by a limited number, volume and variety of stocks traded; and by a narrow range of participants, with government often dominant (*Drake, 1977*). The financial markets historically have been relatively illiquid and heavily regulated in many developing countries. Similarly, in Pakistan earlier in capital market's history, pricing decisions were heavily regulated and there were often fewer protections for investors.

The bond and stock markets were constrained by a defective regulatory framework, lack of liquidity, limited arbitrage, high transaction costs, and poor response to various concessional and fiscal incentives. There have been restrictions for companies who could not offer shares at above the book value (*Mirza, 1993*). These inefficiencies in supervised and managed economies caused by interventionist economic policies and over reliance on debt financing as well as the tighter lending policies forced the developing countries to reconsider their policies and search for alternative options.Consequently, measures were taken to move towards more efficient and liberalized market. In addition, the reforms and institutional developments were initiated to remove the inefficiencies and market distortions to support the economic growth in the country (*Nishat, 1999; Nishat, 2008*). These restructuring reforms which were directed to capital market strengthening, included privatization of nationalized banks, corporate governance, improving asset quality, consumer financing, legal reforms, prudential regulations, credit rating and reduction in corporate taxation etc. The objectives of these reforms were to improve the financial intermediations and maintaining stability and boosting sustainable growth (*Nishat, 2008*).

This study attempts to analyze the long run as will as short run relationship between the stock price and financial liberalization in case of Pakistan using more comprehensive and recent technique of Bounds Test approach. This study combines these two strands of literature i.e. it investigates the association among share prices, macroeconomic variables and financial liberalization in the context of an emerging economy. Therefore, the line of research pursued in this study is the inter-linkage of the relationships among corporate finance and macroeconomic policies. The major contribution of this paper is the use of liberalization index, Quarterly GDP data to measure economic activity and to analyze the impact of liberalization and size of financial market on stock returns. This liberalization index and Quarterly GDP and investment data has not been use before for this analysis in the context of share price.The structure of the paper is as follows: Section II presents the theoretical background of the relationship between stock prices and certain explanatory variables. Section III specifies the econometric methodology and data. Section IV presents the estimation results. Finally the last section summarizes the main results along with concluding remarks.

II-Theoretical Background

In literature, the inter-relationship of share returns and the macroeconomic variables has been a subject of interest. It is argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, the exchange rate and the inflation. Shiller (1988) argues that variation in stock prices reflect changes in investor's expectations about future values of certain economic variables that affect directly the pricing of equities. Anecdotal evidence from the financial press indicates that investors believe that fiscal, monetary policies and macroeconomic events have a large influence on the volatility of the stock price. This implies that macroeconomic variables and the condition of financial markets can influence investors' investment decision and motivates many researchers to investigate the relationships between share returns and macroeconomic variables.

Various measures can be used to measure economic activity in the economy such as GDP growth rate and industrial production index. GDP presents a measure of overall economic activity in the economy and affects stock prices through its influence on expected future cash flows (Fama, 1990). Thus, we would expect a positive relationship between stock prices and aggregate economics activities. In this study the growth rate of real GDP (GDPG) will be used to capture the impact of economic activity/business cycles on stock prices.Investment and share prices are closely linked in neoclassical investment theory. Managers make investment decisions on the basis of whether the investment will improve the future value of the firm. As share prices are forward looking variables which condense information regarding a firm's expected value. Therefore, movements in share prices and investment will be positively correlated.

Gross capital formation (INV) is used as a proxy for real investment and a positive relationship with share prices index is expected.From an emerging market perspective, the analysis of the interactions between stock prices and exchange rates is interesting for a couple of reasons. First, emerging markets are in the forefront of liberalization. Their exchange rate regimes have moved towards more flexible from pegged arrangements. Second, emerging countries' stock markets have developed, but they also became more prone to contagion effects once their integration in the global financial markets intensified.Classical economic theory suggests a positive relationship between the stock market performance and the exchange rate behaviour. For example, "flow oriented" models of exchange rate determination, affirm that currency movements affect international competitiveness and the balance of trade position, and consequently the real output of the country, which in turn affects current and future cash flows of firms and their stock prices. Movements in the stock market may also affect exchange rates. Equities, being part of wealth, may affect the behaviour of exchange rates through the demand for money according to the monetarist models of exchange rate determination.

Similar links can be traced through the portfolio-balance models as well (Branson, 1983 and Frankel, 1983). Therefore, we expect a positive relationship between stock prices and exchange rates (ER) with direction of causation running from exchange rates to stock prices. As domestic currency depreciation (exchange rate increase) makes local firms more competitive, leading to an increase in their exports. This in turn raises their stock prices. However, there is lack of theoretical consensus on the relationship between exchange rate and stock prices.According to portfolio balance theory of money demand, an increase in interest rate would increase the required rate of return on interest bearing securities and the share price would decrease with the fall in demand for stocks. An increase in interest rate would raise the opportunity costs of holding money, and the trades off to holding other interest bearing assets would lead to a decrease in share price (*French et al.1987).* We expect a positive correlation between the nominal interest rate (IR) and the risk-free rate of the valuation model. Thus, a change in nominal interest rates should move asset prices in the opposite direction.

The general theory suggests that there is negative relationship between stock prices & inflation. Actual inflation will be positively correlated with unanticipated inflation, and will, ceteris, paribus move asset prices in the opposite direction. It may be argued that the effect on the discount rate would be negated if cash flows increase at the same rate as inflation. However, cash flows may not go up in same proportion with inflation. DeFina (1991), among others, suggests that the pre-existing contracts would deny any immediate adjustments in the firm's revenues and costs. Indeed, one might argue that cash flows should initially decrease if output prices lag input costs in response to rising inflation. Therefore, the expected relationship between inflation (INF) and stock prices is negative.The effect of changes in money supply on stock returns has been a matter of controversy among economists.

Those in favour of presence of links between money market and stock market argue that any change in money supply creates a wealth effect which disturbs the existing equilibrium in the portfolio of investors. When they re-adjust their asset portfolio, a new equilibrium is established in which the price level of various assets is changed. On the other hand, if the stock market is efficient, it would already have incorporated all the current and anticipated changes in money supply. Consequently, a causal relationship between changes in money supply and stock prices will not be established. Moreover if the change in money supply coincides with a corresponding change in the velocity of money, it will not have any effect on stock prices. Therefore, we cannot anticipate any direction of causation between share prices and money supply (MS).According to theory, growth in the size of financial market has positive affect on stock prices. As financial market expands, it encourages investors to invest in stock market and ultimately increase stock prices.In this study we use Market Capitalization as a percentage of GDP (MCAP) to measure the size of financial market and expect a positive relationship with share prices.

The regulation of the financial markets, which implies among other measures, i.e. interest ceilings, high reserve ratios and implicit credit programs, leads to lower investment ratios and has a negative impact on share prices index, according to financial liberalization theorists. Financial market liberalization, which leads to capital inflow, creates investment in stock market and ultimately increases the stock returns.The appropriate measure of liberalization is the liberalization dating convention because financial liberalization is a process rather than a one shot event. This approach relies on country reports that provides an up-date on the status of reforms and institutional development either voluntarily or under requirement of International Financial Institutions (Laeven, 2003).

We will use convention of dating deregulation in banking and stock markets. On the basis of this information year by year, we will construct an indexes (LIB) on the base of following measures.

1. Interest rate liberalization
2. Reduction in reserve requirements
3. Reduction in directed credit,
4. Foreign bank entry;
5. Privatization of domestic banks,
6. Scope of activities in banking sector
7. Increased prudential regulations
8. Stock market opening to foreigners
9. Stock trading system
10. Incentives to foreign investors
11. NBFIs for investment in securities
12. Issue of share capital
13. Exchange liberalization

We will use dummy variables for these thirteen indicators of financial sector development, one in the year and succeeding years in which these measures have taken (occurred) and zero otherwise. Then the figures are summed to reflect the strength of liberalization in the economy.

Table 1
Financial Liberalization Index (FLIB) and

Year	FLIB	Year	FLIB	Year	FLIB	Year	FLIB
1973	0	1982	0	1991	4	2000	13
1974	0	1983	0	1992	4	2001	13
1975	0	1984	0	1993	5	2002	13
1976	0	1985	0	1994	7	2003	13
1977	0	1986	0	1995	9	2004	13
1978	0	1987	0	1996	10	2005	13
1979	0	1988	0	1997	13	2006	13
1980	0	1989	0	1998	13	2007	13
1981	0	1990	0	1999	13		

The above figures in table 1 focus on changes in the degree of financial market liberalization at time t. The figure in LIB column is sum of the number of measures that has been implemented with respect to 13 components of financial market liberalization indicated above. The index ranges from 0-13, with 13 indicating the highest level of financial liberalization in a particular year. (Appendix 1 provides the detail of year of financial liberalization in Pakistan.)

I. Econometric Methodology and Data

Based on the discussion in the above section the general econometric model for describing the determinants of the share prices is given by the following equation.

$$SP_t = \alpha + \beta_1 GDPG_t + \beta_2 INV_t + \beta_3 ER_t + \beta_4 IR_t + \beta_5 INF_t + \beta_6 MS_t + \beta_7 MCAP_t + \beta_8 FLIB_t + \varepsilon_t \qquad (1)$$

$t = 1, \ldots\ldots 140$

Where

SP	=	*KSE share prices Index*
GDPG	=	*Gross Domestic Product (GDP) growth rate measures economic activity in the economy*
INV	=	*Gross Fixed Capital Formation (GFC) as a proxy for investment*
ER	=	*Exchange rate (Units of domestic currency/ unit of US $*
IR	=	*interest rate*
INF	=	*Inflation rate*
MS	=	*Money Supply in the economy represented by M2.*
MCAP	=	*Market capitalization as a percentage of GDP, proxy for the size of financial market*
FLIB	=	*Financial Liberalization Index*
ε_{it}	=	*error term*

The above model is considered under assumption for consistency and efficiency. These assumptions are as follows: (i) $E(\varepsilon_t) = 0$ for all t; (ii) $E(\varepsilon_t)^2 = \sigma^2 I$ for all t and (iii) $E(\varepsilon_i, \varepsilon_j) = 0$ if $i \neq j$, β_i are all BLUE under above assumptions.

To estimate the cointegration relationship between share price index and its determinants, we employ the bounds testing procedure (Modified-ARDL) recently developed by Pesaran, Shin, and Smith (2001). The statistic underlying the procedure is the *F*-statistic in a generalized Dickey-Fuller type regression, which is used to test the significance of lagged levels of the variables under consideration in a conditional unrestricted equilibrium correction model (UECM). This procedure has several advantages over alternatives such as the Engle and Granger (1987) two-step residual-based procedure for testing the null of no cointegration or the system-based reduced-rank regression approach pioneered by Johansen (1988, 1995) and Johansen and Juselius (1990).[1] To implement the bounds test to obtain robust results for the long run relationship, we have defined a vector Zt consisting of five sets of variables as Zt= (SP, MEV, MCAP, FLIB), where SP is a dependent variable, MEV is a set of macroeconomic regressors, MCAP is the size of financial market and FSLI is the vector of financial liberalization index.

[1] The first main advantage is that the bounds test approach is applicable irrespective of whether the underlying regressors are purely *I(0),* purely *I(1),* or mutually cointegrated. Thus, because the bounds test does not depend on pre-testing the order of integration of the variables, it eliminates the uncertainty associated with pre-testing the order of integration. Pretesting is particularly problematic in the unit-root-cointegration literature where the power of unit root tests is typically low, and there is a switch in the distribution function of the test statistics as one or more roots of the x_t process approach unity (Pesaran and Pesaran 1997, p. 184). Second, the UECM is likely to have better statistical properties than the two-step Engle-Granger method because, unlike the Engle-Granger method, the UECM does not push the short-run dynamics into the residual terms (Pattichis 1999; Banerjee et al. 1993; Banerjee, Dolado, and Mestre 1998).
The other major advantage of the bounds test approach is that it can be applied to studies that have a small sample size. It is well known that the Engle and Granger (1987) and Johansen (1988, 1995) methods of cointegration are not reliable for small sample sizes, such as that in the present study. Several previous studies, however, have applied the bounds test to relatively small sample sizes, i.e. Pattichis (1999) uses the bounds test approach to estimate a disaggregated import demand function for Cyprus employing annual data for 1975–94 (twenty observations). Other related studies in this regard are Tang and Nair (2002), Narayan and Smyth (2003), Narayan (2004b) and Narayan and Smyth (2004).

The data generating process of Zt is a p-order vector autoregression. For cointegration analysis it is essential that $\Delta(Lev)_{it}$ be modeled as a conditional error correction model (ECM):

$$\Delta(SP)_t = \alpha + \lambda 1(SP)_{t-1} + \lambda_2(MEV)_{t-1} + \lambda_3(MCAP)_{t-1} + \lambda_4(FLIB)_{t-1}$$
$$+ \sum_{j=1}^{n} \beta_j \Delta(SP)_{t-j} + \sum_{j=0}^{n} \gamma_j \Delta(MEV)_{t-j} + \sum_{j=0}^{n} \psi_j \Delta(MCAP)_{t-j} + \varepsilon_{it} \qquad (2)$$

Here, λ_i is the respective long run results (coefficients) and α is the drift. Lagged values of Δ (SP_t) and current and lagged values of Δ (MEV_t) *and* Δ $(MCAP_t)$ are used to model the short-run dynamic structure. The bounds testing procedure for the absence of any level relationship between SP_t and exogenous variables (MEV_t , $MCAP_t$ and $FLIB_t$) is through exclusion of the lagged-level variables $(SP_{t-1}, MEV_{t-1}$ and $MCAP_{t-1})$ in equation (2). It follows, then, that our test for the absence of a conditional level relationship between SP_t and exogenous variables (MEV_t , $MCAP_t$ and $FLIB_t$) entails the following null hypothesis for no cointegration:

$$H_0: \qquad \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0$$

Against the alternative hypothesis of cointegration:

$$H_1: \qquad \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 = 0$$

The F test has a non-standard distribution which depends upon (i) whether variables included in the ARDL model are $I(0)$ or $I(1)$, (ii) the number of regressors, and (iii) whether the ARDL model contains an intercept and/or a trend. Given a relatively small sample size in this study of 30 observations, the critical values used are as reported by Narayan (2004) which are based on small sample size between 30 and 80[2]. The test involves asymptotic critical value bounds, depending whether the variables are I (0) or I (1) or mutually cointegrated. Two sets of critical values are generated i.e. I (1) and I (0). Critical values for I (1) refers to upper bound critical values; while the critical values for I (0) refers to the lower bound critical values.The ARDL method estimates $(p+1)^k$ number of regression in order to obtain optimal lag length for each variable, where p is the maximum number of lag to be used and k is the number of variables in equation.

If the F test statistic exceeds their respective upper critical values, we can conclude that there is evidence of a long-run relationship between the variables regardless of the order of integration of the variables. If the test statistic is below the lower critical value, we fail to reject the null hypothesis of no cointegration and if it lies between the bounds a conclusive inference cannot be made without knowing the order of integration of the underlying regressors. Once a long-run relationship has been established, in the second stage, a further two-step procedure to estimate the model is carried out. First the orders of the lags in the ARDL model are selected using an appropriate lag selection criterion such as the Schwartz Bayesian Criterion (SBC), and in the second step, the selected model is estimated by the ordinary least squares technique. The mathematical derivation of the long-run model can be found in Pesaran and Pesaran (1997) and Pesaran, Shin, and Smith (2001). A condensed version of the methodologies can also be found in Narayan (2004b) and Narayan and Smyth (2003, 2004).

In case of evidence of long-run relationship (cointegration) of the variables, we proceed to estimate the following long-run model as:

$$SP_t = \alpha_1 + \sum_{i=1}^{n} \beta_j (SP)_{t-i} + \sum_{i=0}^{n} \gamma_j (MEV)_{t-i} + \sum_{i=0}^{n} \psi_j (MCAP)_{t-i} + \delta(FLIB)_t + \varepsilon_{it} \qquad (3)$$

[2] Pesaran and Pesaran (1997) and Pesaran et al. (2001), however, generated critical values based on 500 and 1000 observations and 20,000 and 40,0000 replications, respectively, which is suitable for large sample size.

In the next stage the error correction model will be estimated for the short run relationship. The error correction model result indicates the speed of adjustment back to the long-run equilibrium after a short-run disturbance. The standard error correction model (ECM) involves estimation of the following equation:

$$\Delta(SP)_t = \alpha_1 + \sum_{j=1}^{n} \beta_j \Delta(SP)_{t-j} + \sum_{j=1}^{n} \gamma_j \Delta(MEV)_{t-j} + \sum_{j=1}^{n} \psi_j \Delta(MCAP)_{t-j} + \delta(FLIB)_t$$

$$+ \lambda_1 (ECM)_{t-1} + \varepsilon_t \quad (4) \qquad (4)$$

To ascertain the goodness of fit the ARDL model, the diagnostic tests and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticity associated with the model. The structural stability test is conducted by using the cumulative residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ). The CUSUM test (Brown, Durbin, and Evans, 1975) is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines.

Data

The time-series data adopted for this study is quarterly and cover the period 1971 to 2005. The data series exchange rate (ER), interest rate (IR), inflation (INF), money supply (MS) are sourced from the IMF, International Financial Statistics, while the data for market capitalization and share prices index is obtained from obtained from the various volumes of quarterly statistical bulletins of SBP. The data for quarterly GDP and Gross Fixed capital formation (GFC) is taken from "Quarterisation of Annual GDP" of Pakistan-Statistical Paper Series No: 5 computed by A.R Kemal and Muhammad Farooq Arby and "Estimating Quarterly Gross Fixed Capital Formation" of SBP Working Paper Series, No. 17, June, 2007 estimated by Muhammad Farooq Arby and Irem Batool respectively.Furthermore, all of the series were transformed into log form. Log transformation can reduce the problem of heteroscedasticity because it compresses the scale in which the variables are measured, thereby reducing a tenfold difference between two values to a twofold difference (Gujarati, 1995).

II. Empirical Result

The underlying assumption of ARDL procedure that each variable in equation (1) is I(1) or I(0). If any variable is integrated of higher order then the procedure is not applicable. Thus, it is still important to perform unit root tests to ensure that none of the variable in equation (1) is I(2) or higher order. Augmented Dickey-Fuller (ADF) unit-root test results are reported in table 2.

Table 2: Unit Root Estimation

VARIABLES	LEVEL		FIRST DIFFERENCE	
	Intercept and Trend	No of Lags	Intercept and Trend	No of Lags
Stock Price (KSE Index)	-2.139	1	-6.292*	1
GDPG	-5.4650*	1	-12.249*	1
Investment	2.456	1	-4.369	1
Exchange Rate	-3.3568**	1	-8.3811*	1
Interest Rate	-2.96	1	-9.8738*	1
Inflation	-2.3363	1	-7.5829*	1
Money Supply	-5.2358*	1	-14.419*	1
M.Cap/GDP	-2.964	1	-10.57*	1

NOTE: *,** represents the level of significance at 1%,5% respectively having critical values of-4.028, -3.443 with intercept & trend.

The order of autoregressive lags (m) is selected such that it produces non-autocorrelated residuals. As the results presented in table 1 show that variables are integrated of mixed order i.e. one or lower, thus we can apply ARDL methodology to our model. The above table shows that KSE Index, Investment, Inflation, Interest Rate and Market Capitalization to GDP, are I(1) and GDP, Exchange Rate & Money Supply are stationary at the level i.e. I(0). The first step of ARDL procedure is to estimate equation (2) and test for the presence of long-run relationship (cointegration) amongst the variables of equation (1). Bahmani- Oskooee and Bohal (2000) have shown that the results of this first step are sensitive to lag length (m) selected in equation (2). The lag length is determined by the Akaike information Criterion .On the basis of AIC, appropriate order of ARDL model is 3. The next step is to estimate equation (2) by varying lag length (m) from 0 to 3 and compute F-statistics for the joint significance of lagged level of variables. The computed F-statistics for each order of lags are given below in table 3.

TABLE 3 BOUND TEST RESULTS

LAG order	F- STATISTICS
0	F(7,125) = 5.7
1	F(7,118) = 5.86
2	F(7,111) = 4.66
3	F(7,104) = 3.97*

Note: The relevant critical value bounds for F-statistic (an unrestricted intercept & no trend) are taken from tables C1.iii in Pesaran et al. (2001). At 5% significance level, the critical value bounds for F-statistic are 2.45 & 3.61. * indicates that computed statistic falls above the upper bonds value.

Examination of results in table 3 shows that test results vary with the order of lags in the model. When the order of lags in equation (2) is 3, computed F-statistic 3.97is above their upper bounds 3.61 and the null hypothesis of no cointegration amongst the variables in equation (1) is rejected at 5% significance level. Thus, there exists a long-run relationship amongst the variables in equation (1). The total number of regression estimated following the ARDL method in equation (2) is $(3+1)^7$ =16384. We can now proceed to second stage of estimation. In the next stage, we select the optimal lag length for ARDL model to determine the long-run coefficients of the model. With maximum order of lag set to 3, lag selection criteria AIC was used to select the appropriate order of ARDL model. The long-run results presented in table 4 indicate that GDP, investment, market capitalization ratio and financial liberalization index are positively correlated while exchange rate and inflation are negatively correlated to stock price (KSE Index).

The most significant factor in determining the impact on stock prices in Pakistan is the Gross Domestic Product growth rate (GDPG) with the coefficient of 1.594 showing that in the long run, 1 percent increase in the GDP leads to on average 1.6 percent increase in the KSE Index. The next significant factor in determining the positive impact on stock prices is the size of the financial market (M.Cap/GDP) and the coefficient of M.Cap/GDP is 0.626 and statistically significant. It shows that in the long run, 1 percent increase in the M.Cap/GDP leads to 0.613 percent increase in the stock prices in Pakistan. Similarly, the impact of financial liberalization on KSE Index is positive and statistically significant in Pakistan. Furthermore, investment is also positively related to share prices index. Coefficients of inflation and exchange rate indicate that they have negative impact on share prices, while money supply and interest rate does not play any significant role in determination of KSE index. In the next step ARDL version of error correction model is estimated by equation 4. Examination of error correction model in table 5 shows that Gross Domestic Product has the strongest positive effect on KSE Index in the short run and statistically significant.

TABLE 4 LONGRUN ESTIMATED COEFFICIENTS

(Dependent variable SP)

Variables	Coefficients	t- Statistic
C	1.3216	1.6246***
GDPG	1.5942	9.3385*
Investment	0.9408	1.5417***
Exchange Rate	-0.9408	-6.9576*
Interest Rate	0.0107	0.2395
Inflation	-0.8359	-2.9388*
Money Supply	-0.0163	-0.2750
M.Cap/GDP	0.6137	16.5871*
Liberalization Index	0.5015	4.0352*
R-squared	0.7616	
Adjusted R^2	0.7545	
Durbin-Watson	1.9917	

NOTE: * , ** &***represents the level of significance at 1%, 5% and 10% respectively.

The next significant factor in determining the positive impact on stock price is the size of the financial market. There is positive and highly significant impact on financial liberalization on share prices index, however, the magnitude is much smaller than that of the long run. The short-run effect of other macroeconomic variables on share price index in Pakistan is weak and statistically insignificant at even 10% significance level. The coefficient of ECM term has correct sign and significant. It confirms a long run relationship between the variables in equation (1). The Coefficient of the ECM term suggests that adjustment process is quite moderate and more than 20% of the previous quarter's disequilibrium in stock prices from its equilibrium path will be corrected in the current quarter.

TABLE 5 SHORT RUN DISEQUILIBRIUM MODEL

(Dependent variable ΔSP)

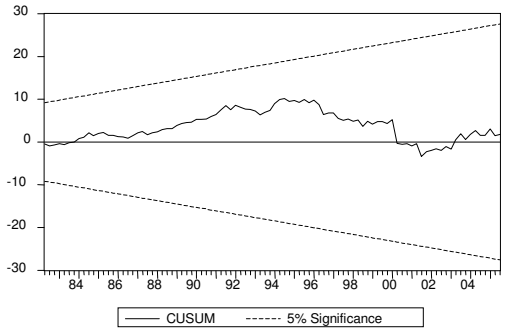
Variables	Coefficients	t- Statistic
C	0.0178	1.3760
Δ(SP(-1)	0.2039	2.4219**
Δ(GDPG)	0.2194	2.8683*
Δ(INV)	0.0456	0.1282
Δ(ER)	-0.2384	-0.8020
Δ(IR)	0.0383	1.1889
Δ(CPI)	-0.2154	-0.5196
Δ(MS)	0.0686	1.1555
Δ(M.Cap/GDP)	0.1386	4.3062*
FLIB	0.1295	3.5933*
ECM(-1)	-0.2148	-4.1028*
Adj. R-squared	0.5237	
Durban Watson	1.904	

NOTE: * &**represents the level of significance at 1%, 5% respectively.

STABILITY AND DIAGONASTIC TEST

Next, we examine the stability of short-run and long-run coefficients. Following Pesaran and Pesaran (1977), we use Brown et al. (1975) stability testing technique. This technique is also known as cumulative (CUSUM) tests. The CUSUM statistics is updated recursively and plotted against the break points. If the plots of CUSUM statistics stay with in the critical bonds of 5% level of significance, the null hypothesis of all coefficients in the given regression are stable and can not be rejected. The CUSUM plot to check the stability of short run and long run coefficients in the ARDL error correction model (table 5) are given below in figure. It shows that statistics CUSUM is within the critical bonds, indicating that all coefficients in the ARDL error correction model are stable.

Plot of Cumulative Sum of Recursive Residuals



V- Conclusion

This study examines the relationships between the KSE Index and a set of macroeconomic variables and financial reforms during the period of 19171 to 2005. This study adopted a different perspective—that is, to test the impact of financial liberalization and macroeconomic variables on KSE Index by using the newly proposed bounds testing approach. Note that this study differs from others by considering other important variables – that is liberalization index and size of the financial market. Using the ARDL approach this study examines whether the KSE Index is cointegrated with a group of macroeconomic variables in the long run and also investigates the short run dynamic linkages between KSE Index and macroeconomic variable.

The empirical evidence shows that the variables are cointegrated i-e there exist a long run & short run relationship between KSE Index and macroeconomic variables and signs of the variables are consistent with the earlier studies. Analysis of this study indicates that GDP is the largest positive determinant of Pakistani stock market in both short run and long run, while inflation is the largest negative determinant in long run. The major finding of this study is that it supports the long run and short run relationship between KSE Index and size of the financial market which has not been investigated before especially in case of Pakistan. In this study we also find that financial liberalization is an important positive determinant of Pakistani stock market in long run.From the above results one can conclude that stock returns in Pakistan are sensitive to the macroeconomic variables and financial liberalization i-e showing that stock returns are best predictor of Pakistan economy. So, there is need to give importance to the forecasting of such variables because they generate activity in stock market which strengthen the financial market and ultimately boost the economy.

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Appendix 1

Year of financial liberalization in Pakistan

S.No.	Liberalization Component	Year
1	Interest rate deregulation	1995
2	Reduced reserve requirement.	1993
3	Removal Priority loans	1995
4	Privatization of bank	1991
5	Foreign bank Entry	1991
6	Scope of banking	1991
7	Prudential regulations	1994
8	Stock market opening	1991
9	Foreigners incentives	1997
10	Trading system	1997
11	NBFIs Investment	1997
12	Issue of capital	1996
13	Exchange liberalization	1994