Is Stock Market Sensitive to Foreign Capital Inflows and Economic Growth? Evidence from Pakistan

Raza, Syed Ali and Jawaid, Syed Tehseen and Afshan, Sahar

IQRA University

5 April 2013

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First Author

Syed Ali Raza
Lecturer,
IQRA University,
Karachi-75300, Pakistan
Email: syed_aliraza@hotmail.com
Tel: +92-333-344-8467
(Corresponding Author)

Second Author

Syed Tehseen Jawaid
Assistant Professor,
IQRA University,
Karachi-75300, Pakistan
Email: stjawaid@hotmail.com
Tel: +92-345-309-4838

Third Author

Sahar Afshan
Business Graduate,
IQRA University,
Karachi-75300, Pakistan
Email: sahar_khan09@hotmail.com

(Preliminary Draft)

Abstract

This study investigates the impact of foreign capital inflows and economic growth on stock market capitalization in Pakistan by using the annual time series data from the period of 1976 to 2011. The ARDL bound testing cointegration approach confirms the valid long run relationship between considered variables. Results indicate that foreign direct investment, workers' remittances and economic growth have significant positive relationship with the stock market capitalization in long run as well as in short run. Results of dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS) suggest that the initial results of long run coefficients are robust. Results of variance decomposition test show the bidirectional causal relationship of foreign direct investment and economic growth with stock market capitalization. However, unidirectional causal relationship is found in between workers' remittances and stock market capitalization. It is suggested that in Pakistan, investor can make their investment decisions through keep an eye on the direction of the considered foreign capital inflows and economic growth.

Keywords: Remittances, Foreign Direct Investment, Economic Growth, Market Capitalization

JEL Classification: F24, F21, F43, G20

1. Introduction

In recent years, strong financial systems recognized as a main determinant of economic stability and development. Efficient financial systems contribute in deployment of monetary resources by initiating long term investment and enhancing monetary intermediation. Stock market is considered as an integral part of the country's financial system. Development of stock markets and financial systems are interrelated through numerous channels with economic conditions of a country. Improved functioning and sound performance of financial markets provide greater yields to the saver through utilizing proficiencies and economy of scales.

Financial development advances economic functions by supporting allocation of investment in an organized way and setting pool of funds available to investors by providing the possibility of huge investment projects. Liquidated nature of Stock market also protects the savers against the stress of losing control over their savings for long period of time and builds the confidence of the investor.[1] A well-functioning stock market offers transmission of information and reduced transaction cost which enable the investors to allocate their investment in profitable projects that can provide fruitful channeling of their saving to investment.[2]

With the rising importance of stock market and international integration, numerous theoretical and empirical researches have specified that economic growth is a genuine reflection of stock market development. Empirical results have indicated the significant positive impact of stock market development on economic growth of diverse economies.[3] Modigliani (1971) claimed that rise in the stock prices leads to increase individual wealth holdings which simultaneously results in higher consumption or savings. Duca (2007) also argues that the

[1]Hicks (1969)
[2] Greenwood and Smith (1996), Sohail and Hussain (2009)
[3]Fama (1981), Levine and Zervos (1996),Beck and Levine (2002),Antonios (2010), Petros (2012) and Raza and Jawaid (2012)

countries doing well in terms of economic growth have better domestic stock market performance. Rapid or sustainable economic growth builds the confidence of domestic or international investors. Increased investment activities ultimately lead to the progress the overall economy.

Capital inflows are mostly found to be linked with stock market performance. Foreign direct investment and workers' remittances are proved to be an important source of capital inflow in developing countries. Foreign direct investment might contribute both positively and negatively in the development of stock market. It is found that greater focus and dependence on FDI may discourage the local industry. Entrance of foreign companies in the imperfect competitive markets may leads to reduce market share of domestic producers. Capabilities of economies of scale also suffer in domestic producers because of loss of market share and result in negative impact on productivity.[4] More of the research shows that foreign direct investment might boost stock market performance, and empirical evidence tends to provide some support to this finding by showing positive relationship between market capitalization and FDI.[5] In most of the developing countries FDI contributes by fulfilling the gaps of technology, capital formation, human capital formation, managerial skills and provide more competitive environment for domestic producers.[6]

Workers' remittances have also become a central source of income for the economic growth of countries. Literature seems to agree that remittances encourage development of the financial sector. Inflow of remittance in the economy assist financial sector by enhancing the level of disposable income especially in emerging countries. Workers' remittances offer growth

[4]Adams (2009)
[5]Claessens, Klingebiel, and Schmukler (2001)
[6]Feder (1982), Helpman and Kruman (1985), Lucas (1988), Edwards (1992), Kueh (1992), Chen et al. (1995), Akber and Naqvi (2000)

in external source of income and contribute to raise minimum wages level in developing countries. This instigates the trend of private savings which further leads to promote investment in stock market by small investors. Increased level of investment and improved standard of living due to inflow of remittance in the country aids the performance of stock market and expedite the financial and economic development.[7]

Stock Market of Pakistan has displayed startling history. Back in 1991, it was given third rank in improved local market index.[8] Regardless of comparatively small size and less attractive political environment, stock market of Pakistan has shown positive features in past. Business week of United States declared Pakistan's stock market best in the world in 2002. The market sustains similar performance for the next three years. As per improved turnover ratio it was bestowed first in 2003 and third in the year 2006.[9] This speedy expansion from the vigorous start of 1991 was supplemented by low rate of interest, better regulation &supervision of the market, ease of liquidity and healthy financial atmosphere (International Monetary Fund 2004).

Prediction of stock market performance and their correlation with relevant macroeconomic variables have been debated massively in the literature. Various researchers considered single risk factor to predict the stock returns.[10] Many others utilized the role of macroeconomic variables with the underline objective of evaluating the sensitivity of stock prices relevant to change in economic factors [Aggarwal (1981), Soenen and Hennigar (1988), Chatrath et al. (1997), Farooq and Keung (2004), Aquino (2004), Ratanapakorn and Sharma (2007)]. Empirical investigations measured the performance of stock markets using various indicators. Market capitalization is the one used most frequently due to its less arbitrary nature

[7] Raza and Jawaid (2012)
[8] International Finance Corporation (1992)
[9] Global Stock Markets Fact book (2004; 2007)
[10] Lau et al. (1974), Jagannath and Wang (1993), Dowen (1988), Raza et al. (2011)

than other procedures and indexes.[11] The supposition of utilizing stock market capitalization as the key indicator of stock market development is that large size of a market is associated with the capacity to mobilize capital, spread risk and improve functioning wide across the market and economy.

Motivation of the Study

The main objective of this study is to examine the relationship between foreign capital inflows, economic growth and stock market capitalization in Pakistan. The economic and financial literature comprises of ample studies on Stock market performance but most of the studies utilizes cross country data.[12] Use of panel data assists in getting broader view of an issue but it lacks specification. It is appropriate for getting average sample results but in order to provide constructive insights and in depth understanding; the results should exhibit detailed findings of countries separately.

The present research builds the distinctive foundations in the literature in six different ways. First, this study is an innovative attempt to investigate the impact of foreign capital inflows and growth of Pakistan's economy on Stock market capitalization. Karachi Stock Exchange (KSE) is not a sustainable market and investors find fluctuations in prices of stocks, for that reason, Karachi stock exchange have very different risk-return relationship. The investors discover that the market goes up or down dramatically in a few sessions. In December 2008, in the Karachi stock exchange, 100 index was down to 3300 points from 9187 points to 5865 points in just 13 trading sessions. After two months, the 100 index of Karachi stock exchange was up to 2638 points from 5707 points to 8345 points in just 19 trading sessions.[13]

[11]Levine and Zervos (1996), Demirguc-Kunt and Levine (1996b)
[12] Levine and Zervos (1998), Garcia and Liu (1999), Billmeier and Massa (2007), Yartey (2010), Cherif and Gazdar (2010)
[13] Raza *et al.* (2011)

These surges the need to explore in depth, the causes of such volatile market capitalization, highlighting its association with foreign direct investment, remittances and economic growth.

Second, this study utilizes long time series data from the period of 1976 to 2011. This long period data will better support in exploring the behavior of market capitalization with the changes in FDI, remittances and economic growth in Pakistan. Third, in this study we use a pioneering methodological contribution. We use the autoregressive distributed lag method of cointegration with the help of unrestricted vector error correction model to investigate the long run relationship between foreign capital inflows, economic growth and stock market capitalization. The ARDL approach has several advantages upon other cointegraion methods. ARDL approach may applies irrespective of the of whether underlying variables are purely *I(0)*, *I(1)* or mutually co-integrated.[14] ARDL approach has estimated better small sample properties.[15] In ARDL procedure the estimations of results is even possible if the explanatory variable are endogenous.[16] This ensures that our conclusions regarding the cointegration relationship of foreign capital inflows, economic growth stock market capitalization are accurate and more reliable as compare to past studies.

Fourth, this study is not constrained by any single econometric approach to estimate long run coefficients as present in most of the past studies.[17] To confirm the robustness of results, initial result is gone through by two sensitivity analyses. First, by utilizing the dynamic ordinary least square (DOLS) and second by using fully modified ordinary least square (FMOLS). Fifth, in order to evaluate the causal association among the factors of the research, a more progressive method of variance decomposition is instigated in this research. The conclusions derived from

[14] Pesaran and Shin (1999)
[15] Haug (2002)
[16] Pesaran and Shin (1999) and Pesaran et al. (2001)
[17] Duca (2007), Sohail and Hussain (2009), Adam and Tweneboah (2009), Hsing (2011)

other causality tests lacks reliability due to the absence of exploring causality beyond the particular time period. On the other hand, variance decomposition method has the advantage of estimating magnitude of projected error variance for the particular series by innovations from each predictor over different time period.[18] This will make ascertain that the results of causality derived from this study would be more accurate and trustworthy as compare to past researches.

Sixth, the present study performs multivariate modeling to predict Market capitalization. Most of the empirical studies of the literature modeled the dynamics of stock market capitalization using bivariate method. This raises the issue of over-generalization, indirect association or even no causality.[19] Furthermore, the omitted variable biasness is also expected to provide spurious results.[20] To avoid such consequences, this study included multiple variables to predict their impact and association with stock market capitalization of Pakistan.

The rest of paper is organized as follow: Section 2 reviews the empirical literature on the relationship foreign capital inflows, economic growth and stock market capitalization. Section 3 discusses the modeling framework; section 4 shows estimations and results, section 5 represents the results of rolling window estimations, section 6 shows the results of dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS), section 7 analyze the causal relationship between considered variables by using variance decomposition method and the final section conclude the study and provide some policy implications.

[18] Wong (2010), Shehbaz et al. (2012) and Raza and Jawaid (2013)
[19] Nachmias, F. and Nachmias, D. (2000)
[20] Stern (1993) and Tang (2009)

2. Literature Review:

The debate on topic the stock market development has been recognized and discussed widely in the economic literature especially in recent years because of the shift of trend towards emerging economies with more progressive econometric methods and accessibility of data.[21]

The findings of abundant econometric research support the view of positive association between stock market development and growth of an economy. We initiate our disclosures of empirical evidences with the potential work of Levine and Zervos (1998) that were among the first to establish the link between stock market development and economic growth. The research results utilizing cross country data of forty nine developed and emerging countries from 1976 to 1993 indicated that stock market performance is positively correlated with real economic growth enlightening strong association specifically for developing countries.

Extending the link, Garcia and Liu (1999) studied the hypothesis that development of stock markets influence growth performance. They find significant correlations between economic growth and stock market capitalization. From the sample of fifteen countries data from 1980 to 1995 the research derived positive and robust relationship between stock market development and economic growth.

Duca (2007) also investigated the causal association between stock market capitalization and economic growth in top five stock markets of the world in terms of stock market capitalization. By applying Granger causality technique, the test results indicated the unidirectional causality between stock market capitalization and economic growth in United States, Japan, United Kingdom and France. However, the link did not support the findings of Germany and exhibit no causal association between stock market capitalization and growth of the economy.

[21]Cherif & Gazdar (2010),Beck et al (2000), Arestis and Demetriades (1997), King and Levine (1993)

For Malaysian economy, Mun et al. (2008) discovered the role of stock market development in economic growth by using forty years annual data. The research employing Granger causality technique identified a mono directional causality between stock market development and economic growth and proposed that the progression of financial sector should be enhanced to support liberalized investment in order to expand the performance of economy.

Utilizing stock returns to measure development of stock market in Pakistan, Sohail and Hussain (2009) investigated the impact of macroeconomic variables on stock returns in both long and short run by considering monthly data from December 2002 to June 2008. Results from Johansen and Juselius cointegration and vector error correction models (VECM) indicated long run association and positive impact of economic growth on stock returns.

Daferighe and Aje (2009) also explored the relationship between stock market performance and economic growth in Nigeria by using data from the period of 1997 to 2006. Results from Regression analysis specified the positive and significant impact of economic growth on stock market performance.

Many empirical studies insist that institutional factors also impact stock market performance and foster financial development.[22] Pagano (1993) demonstrated that security concerns and law & order condition of any country have significant impact on stock market performance. Law and Habibullah (2009) also performed cross country analysis in this context by studying twenty seven countries from the period of 1980 to 2001. The results from panel data established that institutional quality is empirically significant in determining capital market growth.

Similarly Yartey (2010) emphasized on institutional determinants of stock market development along with macroeconomic factors utilizing cross country data of forty two

[22]Yartey (2008), Beck et al. (2003), Girma and Shortland (2008)

developing economies from 1990 to 2004. The results identified that economic growth measured by income level positively contributed to the development of stock market. The results also indicated that political risk, bureaucratic excellence and security conditions are significant to support progress of stock market. The study recommended that resolution of political risk is critical determinant of expansion of developing stock markets.

Contrary to Yartey (2010) test results, Cherif and Gazdar (2010) substantiated the role of macroeconomic variables and institutional quality in advancement of stock market. The study sampling data of 18 years of fourteen MENA countries evidenced that income level indicating economic growth positively influenced market capitalization but institutional environment captured by a composite policy risk index was insignificant to effect market capitalization in MENA countries.

In recent researches, Adaramola (2011) scrutinized the relationship between macroeconomic variables and stock prices in Nigeria by using the quarterly data from the first quarter of 1985 to fourth quarter of 2009. Results indicate the significant positive impact of economicgrowth on stock prices.

Hsing (2011) also investigated the relationship between market capitalization and economic growth by using the quarterly time series data from the period of 2000 Q1 to 2010 Q2. Regression results indicated the positive and significant impact of economic growth on stock market performance.

Sahu and Dhiman (2011) when inspected the causal association between stock market development and economic growth in India from the period of 1980 to 2006, found no causal relationship between Bombay stock exchange and economic growth. They concluded that

development in Bombay stock exchange cannot be called as an indicator of economic growth of India.

The current economic challenges of various world economies practiced both increases in foreign direct investment and stock market activities. This increases the concerns of researchers in identifying link between FDI and stock market development. Raza et al (2012) analyzed the role of foreign direct in Stock market advancement of Pakistan using annual time series data for the period 1988-2009. The results from regression revealed the significant positive impact of foreign direct investment in evolving Stock markets of Pakistan.

For Ghana, Adam and Tweneboah (2009) explored the relationship between foreign direct investment and stock market capitalization using the quarterly time series data from 1991 to 2006. Co-integration and Variance Decomposition method have been used to explore the relationship and verified the presence of the positive association between foreign direct investment and stock market development. Results also suggested the unidirectional causality exist from foreign direct investment to market capitalization.

Kaleem and Shahbaz (2009) also empirically recognized the relationship between foreign direct investment and stock market capitalization in Pakistan by using the annual time series data from the period of 1971 to 2006. auto regressive distributed lag (ARDL) bound testing approach and error correction method techniques have been used for long run and short run estimations respectively. Results revealed the positive and significant impact of foreign direct investment on stock market capitalization in long run as well as in short run.

Utilizing Stock market capitalization to measure development of financial sector in Nigeria, Oke (2012) examined the linkage between FDI and Market capitalization by considering annual data from 1981 to 2010. Results from co-integration and error correction models specified

positive association between FDI and market capitalization in short run however, the study failed to find long run connection between inflows of foreign direct investment and development of Nigerian financial sector.

More recently, Zafar (2013) studied the hypothesis that foreign direct investment influences the development of stock markets in Pakistan. Employing annual data from 1988 to 2008 the research derived strong positive association between stock market development and FDI and recommended that if foreign direct investment as a percentage GDP rises by 1 % Market capitalization as percentage of GDP increases by 6.78 %.

Observing the diverging trend of global flow of remittances to emerging economies and their rising stock market activities, Shahbaz et al. (2007) investigated the relationship between workers' remittances and financial sector development in Pakistan by using the annual time series data from the period of 1971 to 2001. Findings from auto regressive distributed lag (ARDL) and Johansen cointegration techniques specified the positive and significant impact of workers' remittances on financial sector development in long run.

Billmeier and Massa (2007) also explored the impact of workers' remittances on stock market capitalization in his cross country analysis of seventeen Middle East and Central Asian countries. Regression results suggested the positive significant effects of workers' remittances on stock market capitalization. Motelle (2011) in his investigation of linkage between remittances and advancement of financial sector of Lesotho indicated the positive and significant impact of workers' remittances on financial sector development. Granger causality test confirmedthat unidirectional causality runs from financial development to remittances in Lesotho economy.

In Nigeria, Oke et al. (2011) examined the connection between workers' remittances and financial development by using the annual data from the period of 1977 to 2009. Generalized

method of moments (GMM) has been used to investigate the link. Results indicated the positive and significant impact of workers' remittances on financial development and recommend the encouragement of workers' remittances through proper formulation and implications of favorable policies.

The evidence from the above-mentioned researches put forward the positive role of economic growth, foreign direct investment and remittances on the advancement of stock market. Hence, this study extends the examination to the case of Pakistan by formulating the analysis of combined contribution of FDI, remittances and economic growth on Market capitalization of Pakistan's stock market.

3. Empirical Framework

In this study, 36 years annual time series data of Pakistan has been used from 1976 to 2011. All data are acquired from different issues of economic surveys of Pakistan. All variables are used in logarithm form.

3.1 Unit Root Test

Augmented Dickey Fuller (*ADF*) and Phillip Perron (*PP*) unit root test are used to examine the stationary properties for long run relationship of time series variables. Augmented Dickey Fuller (*ADF*) test is based on equation given below:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t$$

Where ε_t is pure white noise error term, Δ is first difference operator, Y_t is a time series, α_0 is the constant and k is the optimum numbers of lags of the dependent variable. Augmented Dickey Fuller (*ADF*) test determines whether the estimates of coefficients are equal to zero. ADF test provide cumulative distribution of ADF statistics. The variable is said to stationary, if the

value of the coefficient δ is less than critical values from fuller table. Phillip and Perron (PP) unit root test equation is given below:

$$\Delta Y_t = \alpha + \rho^* Y_{t-1} + \varepsilon_t$$

The Phillip and Perron unit root test is also based on t-statistics that is associated with estimated coefficients of ρ^*.

3.2 ARDL Bound Testing Approach

The Auto Regressive Distributed Lag method of cointegration developed by Pesaran and Pesaran (1997), Pesaran and Shin (1999) Pesaran *et al.* (2000, 2001) has been used with the help of unrestricted vector error correction model to investigate the long run relationship between foreign capital inflows, economic growth and stock market capitalization. The ARDL approach has several advantages upon other cointegraion methods. ARDL approach may applies irrespective of whether underlying variables are purely *I(0)*, *I(1)* or mutually co-integrated.[23] ARDL approach has estimated better small sample properties.[24] In ARDL procedure the estimations of results is even possible if the explanatory variable are endogenous.[25] The ARDL model is developed for estimations as follow:

$$\Delta \mathrm{MKC_t} = \psi_0 + \psi_1 \sum_{i=1}^{p} \Delta \mathrm{MKC_{t-1}} + \psi_2 \sum_{i=1}^{p} \Delta \mathrm{FDI_{t-1}} + \psi_3 \sum_{i=1}^{p} \Delta \mathrm{REM_{t-1}}$$

$$+ \psi_4 \sum_{i=1}^{p} \Delta \mathrm{GDP_{t-1}} + \gamma_1 \mathrm{MKC_{t-1}} + \gamma_2 \mathrm{FDI_{t-1}} + \gamma_3 \mathrm{REM_{t-1}} + \gamma_4 \mathrm{GDP_{t-1}} + \mu_t$$

Where ψ_0 is constant and μ_t is white noise error term, the error correction dynamics is denoted by summation sign while the second part of the equation corresponds to long run relationship. Schwarz Bayesian Criteria (*SBC*) has been used to identify the optimum lag of

[23] Pesaran and Shin (1999)
[24] Haug (2002)
[25] Pesaran and Shin (1999) and Pesaran et al. (2001)

model and each series. In ARDL model we first estimate the *F*-statistics value by using the appropriate ARDL models. Secondly, the Wald (*F*-statistics) test is used to investigate the long run relationship among the series. The null hypothesis of no cointegration is rejected if the calculated *F*-test statistics exceeds the upper critical bound (UCB) value. The results are said to be inconclusive if the *F*-test statistics falls between the upper and lower critical bound. Lastly, the null hypothesis of no cointegration is accepted if the *F*-statistics is below the lower critical bound. If long run relationship between foreign capital inflows, economic growth and stock market capitalization is found then we estimate the long run coefficients. The following model will be use to estimate the long run coefficients:

$$\mathrm{MKC_t} = \zeta_0 + \zeta_1 \sum_{i=1}^{p} \mathrm{MKC_{t-1}} + \zeta_2 \sum_{i=1}^{p} \mathrm{FDI_{t-1}} + \zeta_3 \sum_{i=1}^{p} \mathrm{REM_{t-1}} + \zeta_4 \sum_{i=1}^{p} \mathrm{GDP_{t-1}} + \mu_t$$

If we find evidence of long run relationship between foreign capital inflows, economic growth and stock market capitalization then we estimate the short run coefficients by employing the following model:

$$\Delta\mathrm{MKC_t} = \varphi_0 + \varphi_1 \sum_{i=1}^{p} \Delta\mathrm{MKC_{t-1}} + \varphi_2 \sum_{i=1}^{p} \Delta\mathrm{FDI_{t-1}} + \varphi_3 \sum_{i=1}^{p} \Delta\mathrm{GDP_{t-1}} + \varphi_4 \sum_{i=1}^{p} \Delta\mathrm{REM_{t-1}} + \mathrm{nEC_{t-1}} + \mu_t$$

The error correction model shows the speed of adjustment needed to restore the long run equilibrium following a short run shock. The n is the coefficient of error correction term in the model that indicates the speed of adjustment.

4. Estimations and Results

To check the stationary properties we use Augmented Dickey Fuller (*ADF*) and Phillip Perron (*PP*) unit root tests. Table 4.1 represents the results of stationary tests. First, these tests are applied on level of variables then on their first difference.

<Insert table 4.1 here>

Results of table 4.1 show that all variables are stationary and integrated at first difference. This implies that the series of variables may exhibit a valid long run relationship.

Autoregressive distributed lag method for cointegration is used to estimate the long run relationship between foreign capital inflows, economic growth and stock market capitalization. The first step is to determine the optimal lag length of the variables. The order of optimal lag length is decided by using the Schwarz Bayesian Criterion. Table 4.2 shows the results of ARDL cointegration method.

<Insert table 4.2 here>

The ARDL results suggest the rejection of null hypothesis of no cointegration in model because the value of the *F*- statistics is greater than upper bound critical value at 5% level of significance in favor of alternative hypothesis that the valid long run relationship is exist between foreign capital inflows, economic growth and stock market capitalization in Pakistan.

Now we estimate the lag length order of the all variables through unrestricted vector auto regression method. The decision criterion is based on minimum value of Schwarz Bayesian Criterion.

<Insert table 4.3 here>

Table 4.3 represents the results of lag length order of all variables. Results of Schwarz Bayesian Criterion indicate that the foreign direct investment and economic growth should be

include in model at 1st lag while stock market capitalization and workers' remittances should be include in model at 2nd lag. After having the valid evidence of long run relationship between foreign capital inflows, economic growth and stock market capitalization now we applied the ARDL method to estimate the long run and short run coefficients. The model for long run coefficients as follow:

$$\mathrm{MKC_t} = \zeta_0 + \zeta_1 \sum_{i=1}^{p} \mathrm{MKC_{t-1}} + \zeta_2 \sum_{i=1}^{p} \mathrm{MKC_{t-2}} + \zeta_3 \sum_{i=1}^{p} \mathrm{FDI_t} + \zeta_4 \sum_{i=1}^{p} \mathrm{FDI_{t-1}}$$

$$+ \zeta_5 \sum_{i=1}^{p} \mathrm{REM_t} + \zeta_6 \sum_{i=1}^{p} \mathrm{REM_{t-1}} + \zeta_7 \sum_{i=1}^{p} \mathrm{REM_{t-2}} + \zeta_8 \sum_{i=1}^{p} \mathrm{GDP_t} + \zeta_9 \sum_{i=1}^{p} \mathrm{GDP_{t-1}} + \mu_t$$

<Insert table 4.4 here>

Table 4.4 shows the results of long run ARDL estimations. Results indicate the positive and significant impact of foreign direct investment, workers' remittances and economic growth on stock market capitalization in Pakistan. The coefficient of GDP showing the highest contribution in the stock market capitalization model, that's means that in long run 1% increase in GDP causes the increases in the stock market capitalization by 0.42%. It is concluded that the economic growth is a better leading indicator for stock market capitalization in Pakistan.

On the other hand 1% increase in FDI and workers' remittances causes the increase in stock market capitalization by 0.34% and 0.25% respectively. Foreign direct investment and workers' remittances both play an important part in the development of stock market of developing economies. Foreign direct investment provides more opportunities of employment conversely, workers' remittances provide external source of income. Both foreign direct investment and workers' remittances play a part to increase in the minimum wages level in

developing countries, which leads to increase in private savings. Increase in private saving may leads to more investment in stock market by small investors.

Following model is used to check the short run relationship among the considered variables with the different lag length.

$$\Delta MKC_t = \varphi_0 + \varphi_1 \sum_{i=1}^{p} \Delta MKC_{t-1} + \varphi_2 \sum_{i=1}^{p} \Delta MKC_{t-2} + \varphi_3 \sum_{i=1}^{p} \Delta FDI_t + \varphi_4 \sum_{i=1}^{p} \Delta FDI_{t-1}$$

$$+ \varphi_5 \sum_{i=1}^{p} \Delta REM_t + \varphi_6 \sum_{i=1}^{p} \Delta REM_{t-1} + \varphi_7 \sum_{i=1}^{p} \Delta REM_{t-2} + \varphi_8 \sum_{i=1}^{p} \Delta GDP_t$$

$$+ \varphi_9 \sum_{i=1}^{p} \Delta GDP_{t-1} + nEC_{t-1} + \mu_t$$

<Insert table 4.5 here>

Table 4.5 represents the short run relationship between foreign capital inflows, economic growth and market capitalization. Results indicate the lagged error correction term for the estimated market capitalization equation is both negative and statistically significant. This confirms a valid cointegration between foreign capital inflows, economic growth and market capitalization in Pakistan. The coefficient of error term is -0.33 suggest that about 33 % of disequilibrium is corrected in the current year. Results indicate the positive and significant impact of foreign direct investment, workers' remittances and economic growth on stock market capitalization in short run.

5. Rolling Window Method

The stability of coefficients of the model in the sample size is evaluated by using the rolling window estimation method. Figure 5.1, 5.2 and 5.3 represent the results of rolling window regression method of foreign direct investment, workers' remittances and economic

growth respectively. Two standard deviation bands show the upper and lower bounds. Results indicate that the all considered variables having positive coefficients throughout the sample period. The results of figure 5.1 shows that the coefficient of FDI is decreases from 1986 to 1996 then there is a steady increase in the coefficient of FDI from 1997 to 2004. The further decrease in coefficient of FDI has been seen from 2004 to 2006 and again sharply increases from 2007 to 2010. The figure 5.2 shows that the coefficient of workers' remittances is continuously increasing from 1998 to 2010. The figure 5.3 shows that coefficient of economic growth is also continuously increasing from 1997 to 2010.

6. Sensitivity Analysis

In this section to check the robustness of initial results of long term coefficients, we use two different sensitivity analyses namely; dynamic ordinary least square (*DOLS*) and fully modified ordinary least square (*FMOLS*).

6.1 Dynamic Ordinary Least Square

The robustness of the relationship between dependent variable and explanatory variables in long run is tested through Dynamic Ordinary Least Square (DOLS) technique developed by Stock and Watson (1993). This method involves estimating the dependent variable on explanatory variable in levels, leads and lags of the explanatory variable. This method resolves the issues of small sample bias, endogeneity and serial correlation problems by adding the leads or lags of explanatory variable (Stock and Watson, 1993). The equation of DOLS model is given below:

$$Y_t = \varphi_0 + \varphi_1 X_t + \sum_{j=-p}^{p} \sum_{i=1}^{k} \theta_{ji} \Delta X_{i,t-j} + \varepsilon_t$$

Where Y_t is the dependent variable, X_t is the vector of explanatory variables and Δ is the lag operator. Table 6.1 represents the results of dynamic ordinary least square of stock market capitalization model. We have run our model of *DOLS* by taking the lead and lag of 2. It is confirmed from results that the coefficients of explanatory variable namely foreign direct investment, workers' remittances and economic growth remain same sign and significance after taking the different lag and lead in the model. Consequently it can be concluded that the relationship between considered variables in Pakistan is remain same and initial results are robust.

<Inset table 6.1 here>

6.2. Fully Modified Ordinary Least Square (*FMOLS*)

The fully modifies ordinary least square technique developed by Philips and Hansen (1991) is also used to analyze the robustness of our initial results long run coefficients. *FMOLS* provides the optimal estimates of the cointegration equation.[26] The *FMOLS* employs kernel estimators of the Nuisance parameters that affect the asymptotic distribution of the *OLS* estimators. The *FMOLS* modifies the *OLS* to control the problems of serial correlation and endogeneity in the regressors that results from the existence of a cointegrating relationship.[27] Results of *FMOLS* are presented in table 6.2.

<Inset table 6.2 here>

It is confirmed from results of fully modified ordinary least square that the coefficients of explanatory variable namely foreign direct investment, workers' remittances and economic growth remain same sign and significance. Consequently it can be concluded that the

[26] Bum and Jeon (2005)
[27] See, Philips and Hansen (1990), Hansen (1995)

relationship between considered variables in Pakistan is remain same and initial results are robust.

7. Variance Decomposition Analysis

It is found in economic literature that Granger causality test has some limitations. The results of Granger causality test weaken its reliability because it cannot analyze the strength of causal relationship beyond the selected time period. Generalized forecast error variance decomposition method under vector autoregressive (VAR) system has been used to analyze the strength of the causal relationship of foreign capital inflows and economic growth with stock market capitalization. The variance decomposition method provides the magnitude of the predicted error variance for a series accounted for by innovations from each of the independent variable over different time period. Wong (2010), Hye (2012) Shahbaz et al. (2012) and Raza and Jawaid (2013) have used this approach to find causal relationship among considered variables. Table 6.1 represents the results of variance decomposition analysis.

<Inset table 7.1 here>

Results of table 7.1 show that in the first round the complete shock of stock market capitalization explain by its own innovations, in the second period 28.43% explain by FDI innovation, 4.54% by real GDP innovation and 1.73% by remittances innovation remaining 65.30% demonstrate by the own stock market capitalization innovation. In period five the 18.92%, 22.38% and 1.38% respectively confers the foreign direct investment, economic growth and workers' remittances. In tenth round 17.63% shock explains by foreign direct investment innovation, 28.48% shock explain by economic growth innovation and 3.02% shock by workers' remittances innovation.

The results indicate that the innovation of foreign direct investment and economic growth explain 17.63% and 28.48% shock in stock market capitalization respectively. Conversely, the innovations of stock market capitalization explain 46.60% shock of foreign direct investment and 17.42% shock of economic growth. These findings suggest the bidirectional causal relationship of foreign direct investment and economic growth with stock market capitalization. The innovative shocks of stock market capitalization explain 27.42% change in the workers' remittances, while, innovations of workers' remittances explains only 3.02% shocks in stock market capitalization. These results suggest the unidirectional causality in between workers' remittances and economic growth.

8. Conclusion and Recommendations

This study investigates the impact of foreign capital inflows and economic growth on stock market capitalization in Pakistan by using the annual time series data from the period of 1976 to 2011. The ARDL bound testing cointegration approach confirms the valid long run relationship between considered variables. Results indicate that foreign direct investment, workers' remittances and economic growth have significant positive relationship with the stock market capitalization in long run as well as in short run.

Results of dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS) suggest that the coefficients of explanatory variable namely foreign direct investment, workers' remittances and economic growth remain same sign and significance. Consequently it can be concluded that the relationship between considered variables in Pakistan is remain same and initial results are robust.

Results of variance decomposition test show the bidirectional causal relationship of foreign direct investment and economic growth with stock market capitalization. However,

unidirectional causal relationship is found in between workers' remittances and stock market capitalization. It is suggested that in Pakistan, investor can make their investment decisions through keep an eye on the direction of the considered foreign capital inflows and economic growth.

From a policy perspective, government and policy makers should encourage and facilitate to the extent possible the uninterrupted flow of foreign capital inflows as they contribute to stable financial and economic development in Pakistan. It is also suggested that the economic growth is a better leading indicator for stock market capitalization in Pakistan. Hence, policy makers should focus on to formulate policies for sustainable economic growth which leads to development of Pakistani stock market.

References

Adam, A. M. & Tweneboah, G. (2009). Foreign Direct Investment and Stock Market Development: Ghana's Evidence. *International Research Journal of Finance and Economic*, Issue 26.

Adams, S. (2009). Foreign Direct Investment, Domestic Investment and Economic Growth in Sub Saharan Africa. *Journal of Policy Modeling,* Vol. 31, pp. 939-949.

Adaramola, A. O. (2011). The Impact of Macroeconomic Indicators on Stock Prices in Nigeria. *Developing Country Studies*, Vol. 1 No. 2.

Aggarwal, R. (1981). Exchange rates and stock prices: A study of the US capital markets under floating exchange rates. *Akron Business and Economic Review*, Vol. 12, pp. 7-12.

Akbar, M. & Naqvi Z. F. (2000). Export Diversification and the Structural Dynamic in the Growth Process: The Case of Pakistan. *The Pakistan Development Review* Vol. 39 No.4, pp. 573–589.

Antonios, A. (2010) Stock Market and Economic Growth: An Empirical Analysis for Germany. *Business and Economics Journal.*

Aquino, R. Q. (2004) A multifactor model of Philippine stock returns using latent macro risk factors. *Applied Economics Letters*, Vol.11 No.15, pp. 961-968.

Beck, T. & Levine, R. (2002). Stock Market, Banks and Growth: Panel Evidence. *NBER Working Paper*, No. 9082.

Beck, T., Demirguc-Kunt, A. & Levine, R. (2003) Law and finance: why does legal origin matter?,Journal of Comparative Economics, Elsevier, vol. 31(4), pp. 653-675.

Billmeier, A. & Massa, I. (2007). What Drives Stock Market Development in the Middle East and Central Asia Institutions, Remittances or Natural Resources. *IMF Working Paper*, WP/07/157.

Chatrath, A., S. Ramchander & F. Song (1997). Stock prices, inflation and output: evidence from India. *Applied Financial Economics*, Vol. 7 No.4, pp. 439-445.

Chen, C. Chang, L. & Zhange, Y. (1995). The Role of Foreign Direct Investment in China's Post-1978 Economic Development. *World Development*, Vol. 23, pp. 691-703.

Cherif, M. and Gazdar, K. (2010) Macroeconomic and institutional determinants of stock market development in MENA region: new results from a panel data analysis,International Journal of Banking and Finance: Vol. 7(1), 139-159

Claessens, S., Klingebiel, D., &Schmukler, S. (2002) Explaining the migration of stocks from exchanges in emerging economies to international centers, Policy Working Paper No. 2816. Washington D.C.: The World Bank

Daferighe, E. E. & Aje, S. O. (2009). An Impact Analysis of Real Gross Domestic Product, Inflation and Interest Rate on Stock Prices of Quoted Companies in Nigeria. *International Research Journal of Finance and Economics*, Issue 25.

Demirguc-Kunt, A., & Levine, R. (1996) Stock market development and financial intermediaries: Stylized facts. World Bank Economic Review, 10, 291-322.

Dicky DA, Fuller WA (1979) Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association* Vol. 74, pp.427-431.

Dowen, R. J. (1988). Beta, Non-systematic risk and Portfolio Selection. *Applied Economics*, Vol. 20, pp. 221-228.

Duca, G. (2007). The Relationship between The Stock Market and The Economy: Experience from International Financial Markets. *Bank of Valletta Review*, Vol. 36,

Edwards, S. (1992). Trade Orientation, Distortion and Growth in Developing Countries. *Journal of Development Economics* Vol. 39, pp. 31–57.

Fama, E. F. (1981). Stock returns, real activity, inflation and money. *The American Economic Review*, Vol. 71, pp. 545-65.

Farooq, M. T. & Keung, D. W. W. (2004), Linkage between stock market prices and exchange rate: A causality analysis for Pakistan. *The Pakistan Development Review*, Vol. 43 No. 4, pp. 639-649.

Feder, G. (1982). Exports and Economic Growth. *Journal of Development Economics*, Vol. 12, pp. 59–73.

Garcia, V.F., & Liu, L. (1999) Macroeconomic determinants of stock market development. Journal of Applied Economics, 2, 29-59.

Girma, S. and Shortland, A. (2008) The Political Economy of Financial Development, Oxford Economic Papers, Vol. 60, Issue 4, pp. 567-596.

Global (2004) Global Stock Markets Factbook, Standard & Poor's, New York

Global (2007) Global Stock Markets Factbook, Standard & Poor's, New York

Greenwood, J., & Smith, B. (1996) Financial markets in development and the development of financial markets. Journal of Economic Dynamics and Control, 21, 145-181.

Haug, A. (2002). Temporal aggregation and the power of co-integration tests: a Monte Carlo study. *Oxford Bulletin of Economics and Statistics* Vol. 64, pp. 399–412

Helpman, E. & Kruman, P. R. (1985). Market Structure and Foreign Trade. Cambridge: MIT Press.

Hicks, J. (1969) A theory of economic history, Oxford: Clarendon Press.

Hsing, Y. (2011). Macroeconomic Determinants of the Stock Market Index and Policy Implications: The Case of Central European Country. *Eurasian Journal of Business and Economics*, Vol. 4 No.7, pp. 1-11.

Hye QAM (2012) Long Term Effect of Trade Openness on Economic Growth in Case of Pakistan. *Quality and Quantity* Vol. 46 No.4, pp. 1137-1149.

International Finance Corporation (1992) Emerging Stock Markets Factbook, Washington, D. C

Jagganath, R. & Wang, Z. (1993). CAPM is alive as well. *The Fourth Annual Conference on Financial Economics and Accounting*, Vol. 1 No.5, pp. 2-57.

Kaleem, R. & Shahbaz, M. (2009). Impact of Foreign Direct Investment on Stock Market Development: The Case of Pakistan. *9th Global Conference on Business and Economics, Cambridge University*, Uk

Kueh, Y.Y. (1992). Foreign Investment and Economic Growth in China. *The China Quarterly*, Vol. 131, pp. 737-690

Kuwornu, J. K. M. & Nantwi, O. (2011). Macroeconomic Variables and Stock Market Returns: Full Information Maximum Likelihood Estimation, *Research Journal of Finance and Accounting*, Vol. 2 No.4

Lau, S. C. Quay, S. R. & Ramsey, C. M. (1974). The Tokyo Stock Exchange and Capital Assets Pricing Model. *The Journal of Finance* Vol. 29 No.2, pp. 507-514.

Law, S.H. &Habibullah, M.S. (2009) The determinants of financial development: institutions, openness and financial development, South African of Economics, 71(1).

Levine, R. & Sara Z. (1996) Stock Market Development and Long-Run Growth, The World Bank Economic Review, Vol. 10, No.2.

Levine, R. & Zervos, S. (1996). Stock Market Development and Long-Run Growth. *World Bank Policy Research Working Paper*, No. 1582.

Levine, R. &Zervos, S. (1998) Stock markets, banks, and economic growth,American Economic Review, 88 (3), 837-558

Lucas, R. E. (1988) On the Mechanics of the Economic Development, *Journal of Monetary Economics* Vol. 22, pp. 3–42.

Modigliani, F. (1971). "Monetary Policy and Consumption", in Consumer Spending and Monetary Policy: the linkages. *Federal Reserve Bank of Boston, Conference Series no. 5*, pp. 9 -84.

Motelle, S. I. (2011). The Role of Remittances in Financial Development in Lesotho: Evidence from alternative measures of financial development. *Journal of Development and Agricultural Economics*, Vol. 3 No.6, pp. 241-251.

Mun, H.W., Siong, E.C. and Long, B.S., (2008) Stock Market and Economic Growth in Malaysia: Causality Test. Asian Social Science, 4, pp. 86-92.

Nachmias, F. and Nachmias, D. (2000) Bivariate analysis, In Research Methods in the Social Sciences 351 – 384, New York: Worth

Oke, B. O. Uadiale, O.M. & Okpala, O.P. (2011). Impact of workers' remittances on Financial Development in Nigeria. *International Business Research*, Vol. 4 No.4.

Oke, M. O. (2012) Foreign Direct Investment and the Nigerian Financial Sector Growth, Asian Economic and Financial Review, Vol. 2, No. 2, pp. 262-275.

Pagano, M., (1993) Financial Markets and Growth: An Overview, European Economic Review, 37, pp. 613-622.

Pesaran, M. H, & Pesaran, B. (1997). Working with Microfit 4.0: interactive econometric analysis. Oxford University Press, Oxford

Pesaran, M. H, & Shin, Y. (1999). An autoregressive distributed lag modeling approach to co-integration analysis. In Strom S (ed) Econometrics and economic theory in the 20th century: the Ragnar Frisch centennial symposium. Cambridge University Press, Cambridge

Pesaran, M. H. Shin, Y. & Smith, R. J. (2000). Structural analysis of vector error correction models with exogenous I(1) variables. *Journal of Econometrics* Vol. 97, pp. 293–343

Pesaran, M. H. Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Economics*, Vol. 16, pp. 289–326

Petros, J. (2012). The Effect of the Stock Exchange on Economic Growth: A Case of the Zimbabwe Stock Exchange. *Research in Business and Economics Journal*, Vol. 6.

Phillips PB, Perron P (1988) Testing for a Unit Root in Time Series Regression. *Biometrika* Vol. 75, pp. 335-346

Ratanapakorn, O. & Sharma S. C. (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics*, Vol. 17 No.5, pp. 369-377.

Raza, A., Iqbal, N., Ahmed, Z., Ahmed, M. and Ahmed, T. (2012) The Role of FDI on Stock Market Development: The Case of Pakistan, Journal of Economics and Behavioral Studies Vol. 4, No. 1, pp. 26-33.

Raza, S. A., and Jawaid, S. T. (2012) Foreign Capital Inflows, Economic Growth and Stock Market Capitalization in Asian Countries: An ARDL Bound Testing Approach, Quality and Quantity, DOI: 10.1007/s11135-012-9774-4.

Raza, S. A., Jawaid, S. T. (2013) Terrorism and Tourism: A Conjunction and Ramification in Pakistan, Economic Modelling, Vol. 33, July, 65-70.

Raza, S.A. Jawaid, S.T. Arif, I. & Qazi, F. (2011). Validity of capital assets pricing model: Evidence from Karachi stock exchange. *African Journal of Business Management*, Vol. 5 No.32: pp. 12598-12605

Sahu, N. C. & Dhiman, D. H. (2011). Correlation and Causality between Stock Market and Macro Economic Variables in India: An Empirical Study. *International Proceedings of Economics Development and Research*, Vol. 3, pp. 281-284

Shahbaz M, Islam F, Aamir N (2012) Is Devaluation Contractionary? Empirical Evidence for Pakistan. *Economic Change and Restructuring* Vol. 45.

Shahbaz, M. Qureshi, M. N. & Naveed, A. (2007). Remittances and Financial Sector's Performance: Under Two Alternative Approaches for Pakistan. *International Research Journal of Finance and Economics.* Issue 12.

Soenen, L. A. & Hennigar, E. S. (1988). An analysis of exchange rates and stock prices: The US experience between 1980 and 1986. *Akron Business and Economic Review*, Vol. 19, pp. 71-76.

Sohail, N. & Hussain, Z. (2009). Long Run and Sort Run Relationship between Macroeconomic Variables and Stock Prices in Pakistan: The Case of Lahore Stock Exchange. *Pakistan Economic and Social Review*, Vol. 47 No.2, pp. 183-198.

Stern, D. I. (1993) Energy use and economic growth in the USA: a multivariate approach. Energy Economics 15: 137-150.

Stock J, Watson MW (1993) A simple estimator of cointegrtaing vector in higher order integrated systems. *Econometrica* Vol. 6 No. 4 pp. 783-820.

Tang, C.F., (2009) Electricity consumption, income, foreign direct investment, and population in Malaysia: new evidence from multivariate framework analysis. Journal of Economic Studies 4, 371-382.

Toda, H. Y. & Yamamoto, T. (1995). Statistical Inference in Vector Autoregressions with Possibly Integrated Processes. *Journal of Econometrics*, Vol. 66, pp. 225-250.

Wong HT (2010) Terms of Trade and Economic Growth in Japan and Korea: An Empirical Analysis, *Empirical Economics* Vol. 38, pp. 139-158.

World Development Indicators (various years), Web Link: http:// http://data.worldbank.org/data-catalog/world-development-indicators

Yahyazadehfar, M. & Babie, A. (2012) Macroeconomic Variables and Stock Price: New Evidence from Iran. *Middle-East Journal of Scientific Research*, Vol. 11 No. 4, pp. 408-415.

Yartey (2010) The institutional and macroeconomic determinants of stock market development in emerging economies, Applied Financial Economics, 20:21, 1615-1625

Yartey, A. C. (2008) The determinants of stock market development in emerging economies: Is South Africa different? IMF Working Paper No. WP/08/32,Washington D.C.: International Monetary Fund.

Zafar, M. (2013) Determinants of Stock Market Performance in Pakistan, Interdisciplinary Journal of Contemporary Research in Business, Vol. 4(9), pp. 1017-1026.

Table 4.1: Stationary Test Results

Variables	Augmented Dickey-Fuller				Phillips-Perron			
	I(0)		I(1)		I(0)		I(1)	
	C	C&T	C	C&T	C	C&T	C	C&T
MKC	2.091	-0.864	-4.974	-4.081	-1.599	-1.625	-4.882	-5.245
FDI	-2.317	-1.508	-4.297	-4.547	-2.119	-1.891	-6.230	-5.923
REM	-0.449	-0.982	-4.178	-4.298	-0.781	-1.220	-4.929	-4.844
GDP	-1.382	-1.112	-3.394	-4.317	-1.674	-1.329	-4.327	-4.263

Note: The critical values for ADF and PP tests with constant (c) and with constant & trend (C&T) 1%, 5% and 10% level of significance are -3.711, -2.981, -2.629 and -4.394, -3.612, -3.243 respectively.
Source: Authors' estimation.

Table 4.2: Lag Length Selection & Bound Testing for Cointegration

Lags Order	AIC	HQ	SBC	F-test Statistics
0	21.687	21.742	21.880	9.321*
1	14.459	14.738	15.427	7.564*
2	13.510*	14.011*	15.252*	5.213*

* 5% level of significant.

Table 4.3: Lags Defined through VAR of Variables

Lag	0	1	2	Selected Lags
	SBC	SBC	SBC	SBC
MKC	13.485	12.099	11.870*	2
FDI	0.777	0.259*	1.078	1
REM	2.444	1.975	1.918*	2
GDP	8.805	2.646*	2.945	1

* indicate minimum SBC values.

Table 4.4: Long Run Results using ARDL Approach

Variables	Coeff.	t-stats	Prob.
C	0.076	0.057	0.955
MKC(-1)	0.128	2.350	0.034
MKC(-2)	-0.305	-1.125	0.279
FDI	0.342	2.310	0.030
FDI(-1)	0.160	2.516	0.025
REM	0.254	3.409	0.002
REM(-1)	-0.191	-0.910	0.372
REM(-2)	-0.386	-1.961	0.070
GDP	0.418	2.516	0.025
GDP(-1)	-0.292	-1.385	0.188
Adj. R^2	0.985		
D.W stats	2.212		
F-stats (Prob.)	172.445 (0.000)		

Source: Authors' estimation.

Table 4.5: Short Run Results using ARDL Approach

Variables	Coeff.	t-stats	Prob.
C	-0.135	-0.276	0.787
ΔMKC(-1)	-0.384	-1.596	0.135
ΔMKC(-2)	-0.035	-0.531	0.605
ΔFDI	0.562	1.959	0.072
ΔFDI(-1)	-0.608	-2.478	0.028
ΔREM	0.199	3.354	0.001
ΔREM(-1)	-0.064	-1.683	0.116
ΔREM(-2)	-0.271	-0.475	0.643
ΔGDP	0.156	1.760	0.081
ΔGDP(-1)	0.234	1.374	0.193
ECM(-1)	-0.331	-3.300	0.001
Adj. R^2	0.848		
D.W stats	1.842		
F-stats (Prob.)	77.345 (0.000)		

Source: Authors' estimation.

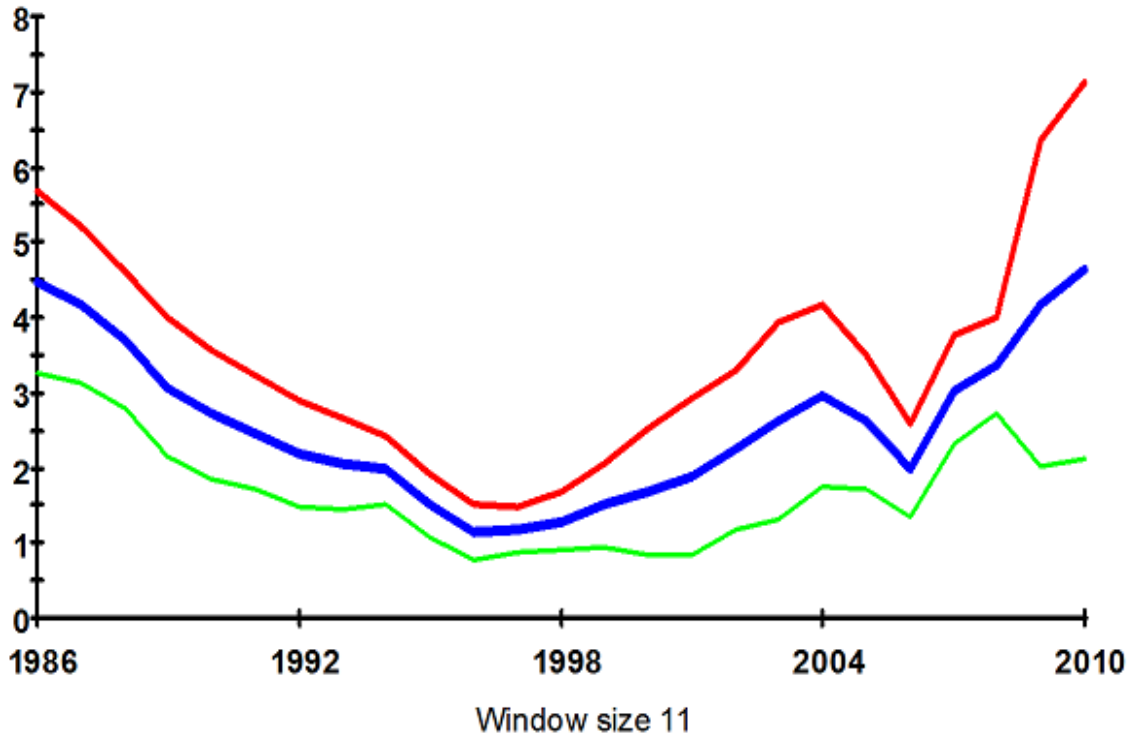

Figure 5.1 Coefficient of FDI and its two S.E. bands based on rolling OLS (Dependent Variable: MKC)

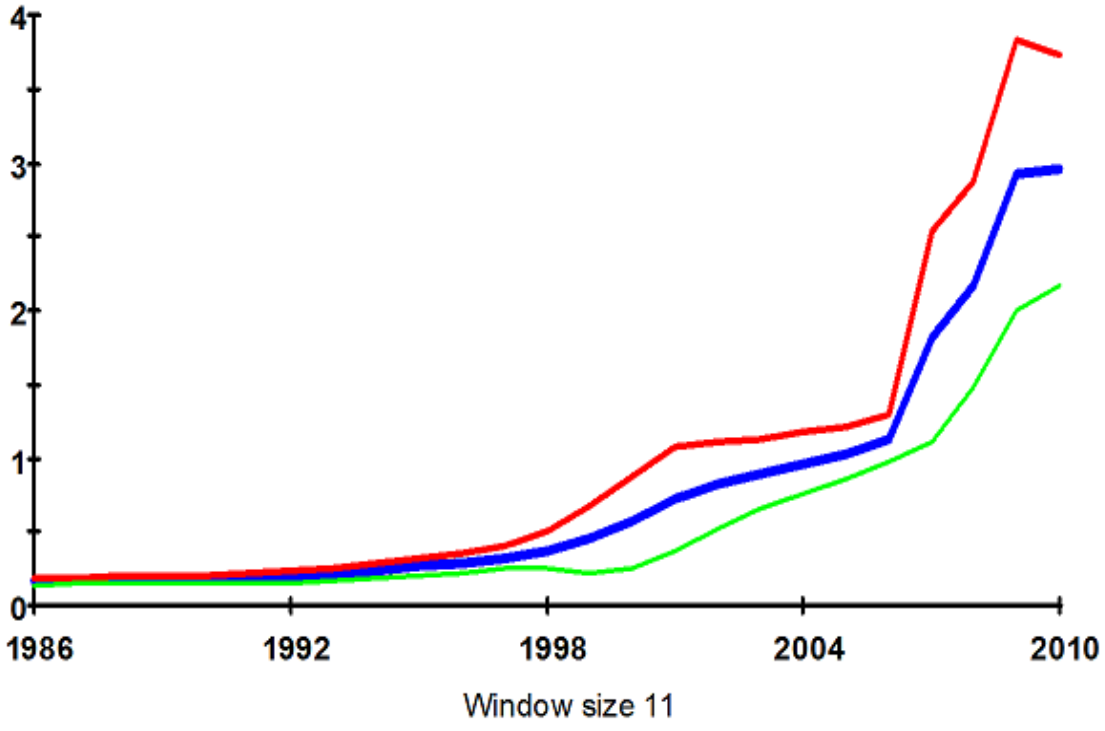

Figure 5.2 Coefficient of REM and its two S.E. bands based on rolling OLS (Dependent Variable: MKC)

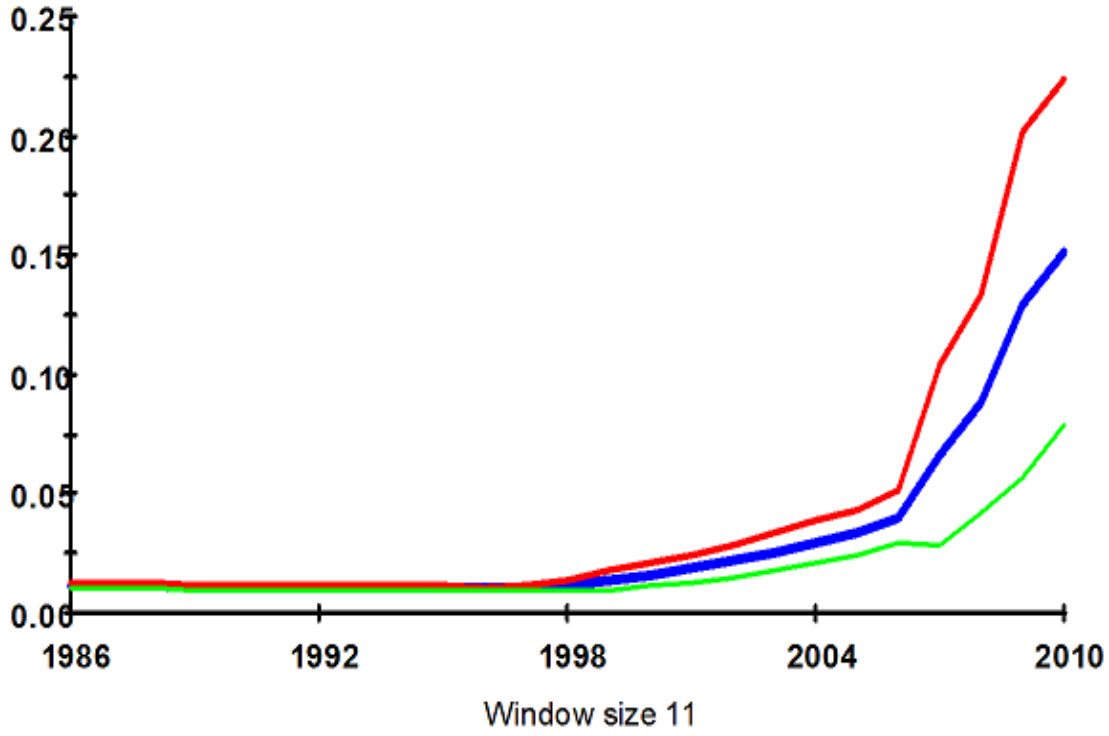

Figure 5.3 Coefficient of GDP and its two S.E. bands based on rolling OLS (Dependent Variable: MKC)

Table 6.1: Results of Dynamic Ordinary Least Square DOLS

Variables	Coeff.	t-stats	Prob.
C	-0.858	-1.707	0.101
FDI	0.309	3.502	0.002
REM	0.453	2.441	0.022
GDP	0.282	6.441	0.000
Adj. R^2	0.957		

Source: Authors' estimation.

Table 6.2: Results of Fully Modified Ordinary Least Square (FMOLS)

Variables	Coeff.	t-stats	Prob.
C	0.231	1.080	0.291
FDI	0.313	1.763	0.091
REM	0.255	5.937	0.000
GDP	0.354	3.359	0.003
Adj. R^2	0.951		

Source: Authors' estimation.

Table 7.1: Results of Variance Decomposition Approach

Period	MKC	FDI	REM	GDP
Variance Decomposition of MKC				
1	100.000	0.000	0.000	0.000
2	65.297	28.429	1.733	4.541
3	52.338	18.504	1.112	28.046
4	55.493	19.512	1.541	23.455
5	57.318	18.922	1.379	22.381
6	51.037	17.401	1.883	29.679
7	49.997	17.706	2.875	29.422
8	51.588	18.348	2.695	27.369
9	50.305	17.929	2.865	28.901
10	50.862	17.634	3.024	28.480
Variance Decomposition of FDI				
1	20.863	79.137	0.000	0.000
2	15.626	55.026	29.224	0.124
3	47.118	33.842	18.909	0.131
4	44.089	31.088	24.248	0.575
5	44.557	30.665	24.218	0.560
6	43.516	33.193	22.259	1.032
7	45.843	31.385	21.547	1.224
8	46.969	28.609	22.721	1.701
9	46.082	27.789	23.544	2.584
10	46.598	27.950	22.797	2.656
Variance Decomposition of REM				
1	2.958	0.315	96.727	0.000
2	3.960	0.290	93.360	2.390
3	16.521	6.382	75.146	1.952
4	15.120	9.906	73.283	1.691
5	16.430	11.421	70.565	1.584
6	18.031	13.427	66.692	1.850
7	22.976	12.614	62.319	2.091
8	27.603	12.460	57.903	2.033
9	27.482	12.832	57.642	2.044
10	27.415	13.413	57.131	2.041
Variance Decomposition of GDP				
1	17.219	0.002	0.362	82.417
2	14.236	7.543	3.019	75.202
3	13.633	5.665	4.812	75.890
4	14.803	4.522	5.291	75.384
5	15.357	7.061	5.023	72.559
6	13.550	6.138	8.661	71.652
7	16.013	6.695	9.754	67.539
8	16.736	10.124	9.362	63.777
9	16.010	10.644	10.426	62.920
10	17.423	11.252	10.434	60.891

Source: Authors' estimation.