

# Inward Remittances, Foreign Direct Investment and Their Impact on Stock Prices: A Time Series Evidence from Karachi, Pakistan

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## Abstract

The purpose of this study is to scrutinize the impact of Personal Remittances and Foreign Direct Investment on KSE100 Index in Pakistan by using annual time series data from 1991-2015. Remittances (REM) and Foreign Direct Investments (FDI) used as an independent variables and KSE100 Index has been used as a dependent variable. Unit Root Test of ADF and PP applied to test the stationarity of variables. Furthermore, Co-Integration test, Ordinary Least Square method and Granger Causality Analysis have been applied to identify the relationship and impact. The results of unit root test (ADF and PP) shows that data is non-stationary at level and stationary at first difference. The results of OLS and Causality analysis shows that REM has a positive and significant impact on KSE100 whereas, FDI puts an insignificant impact on dependent its variable. It is therefore, suggested for the growth of Pakistan, the Government and policy maker should work on its exchange rate that helps to increase the FDIs in Pakistan and ultimately it can cause to accelerate economic growth of a country.

**Keywords:** FDI, KESE100 Index, Remittances, Stock Price

## Introduction

It is believed that domestic economic basics plays an important part in the execution of stock market. Knowledge related to stock indices sensitivity to macroeconomic behavior of essential variables and sensitivity of key variables to stock exchange is very important in context of major areas of finance and investment. The stock indices movement is respective to the change in macro-economic basics. (Khan & Sharif, 2012). Nevertheless, the association between macroeconomic factors and stock prices has been widely examined in developed capital markets and the literary works on that study dates back to 1970s. The connection between macroeconomic factors and stock prices has been analyzed in Emerging Stock Markets (ESMs) after 1080s (Menike, 2006). Moreover, Effective capital markets are important for financial development and success. A most fundamental part of capital market is the stock market, the progress of which is associated with the national level of reserve funds, investment and the rate of monetary /economic growth. Stock market of Pakistan had been named one of the quickest developing markets. Karachi Stock Exchange (KSE) is the greatest and the most liquid exchange in Pakistan therefore resulted as a major source of capital arrangement in Pakistan.

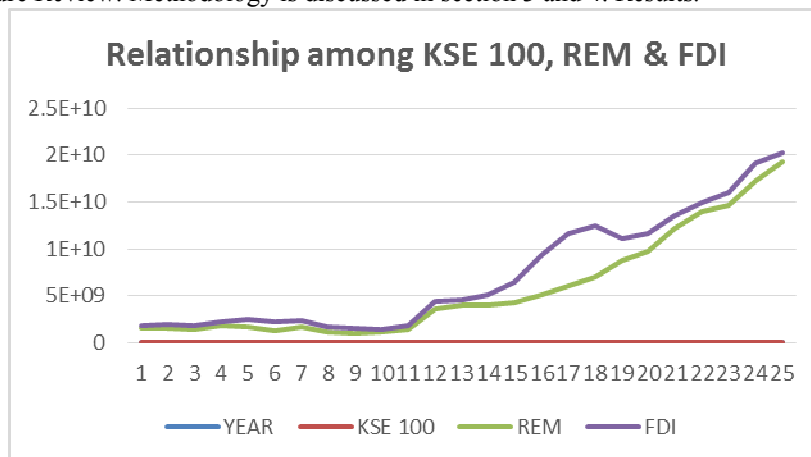
The foreign and the local investors trust in the speculation condition of Pakistan has remarkable progress in the stock market indices in the recent years. The developing countries are experiencing changes in the formation of capital flow in their economies in view of extension and unification of the world equity markets. The stock markets are also witnessing this remarkable change. The FDIs, foreign direct investment have become significant/vital source of finance in developing countries like Pakistan (Kalim & Shahbaz, 2009). Whereas, Pilinkus, 2009 narrated in his research about the relationship between stock market and macroeconomic variables like, FDI, Net Export and GDP deflator. It is revealed that the given variables lead Lithhuanian Stock market return. However, Hasanzadeh & Kiavand analyzed the impact of Macroeconomic variables on stock market in Tehran stock exchange. They examined number of variables i-e GDP, Exchange rate, money supply and gold prices. Results shows that Iran's stock market is significantly influenced by GDP and MS (Money supply) whereas, negatively affected by gold prices.

Remittances play a vital role and positive impact on productivity and employment directly and indirectly through its effect of investment. (Leon, Ledesma & Piracha, 2004). The Pakistan stock market is an emerging stock market. Ali, Haq & Ullah (2015). They further examined the contribution of macroeconomic indicator to the stock market development. KSE was taken as dependent variable while gross domestic savings (GDS), MS and foreign remittances as independent variables. It is verified that GDS and MS significantly contributed to the progress of KSE in both short-run and long-run while foreign remittances had insignificant effect in both short-run and long-run on stock markets of Pakistan because major part of FR are used in consumption. Few studies reveal the relationship among FDI and Remittances. Seabra & Flach (2005) scrutinized the extent of causal relation between Foreign Direct Investment and Profit Remittance in Brazil.

For developing countries, remittances are also huge in respect to other financial flows. Throughout the latest 10 years period of time, flows of remittances amounted to around 33% of export earnings, more than twice private capital flows, nearly 10 times official capita flow, and more than 12 times official transfers. Remittances have even at present become as large as FDI flows to developing countries. (IMF working paper, 2009). Thus in this paper we expect to reveal some insight into the current relationship of Stock prices of KSE, foreign direct

investments (FDI) and remittances based on practical evidence from Pakistan.

Rest of the paper is organized in this way, following introduction, section 2 theoretical background and Empirical Literature Review. Methodology is discussed in section 3 and 4. Results.



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## 2. Literature Review

### 2.1 Theoretical Background

Based on wide literature review the following framework designed to ascertain the impact of independent variables (FDI & REM) on dependent variable (KSE 100 Index).

#### 2.1.1 Stock prices:

Stock prices plays an important role in the development of a country's economy, it acts as a major economic indicator in economic/monetary movement. Stock markets are presume to promote economic growth by allocating an uplift to domestic savings/funds and expanding the quality and quantity of investment. Stock market is influenced by many internal and external elements which put an impact on its performance. (Nauman & Amanullah, 2012). By concentrating on the latest worldwide extention by methods of FDI's , Stock market response to FDI's relies on the cooperation between the entry mode and area of the investment, the identity of the financial specialist and the respective international exposure. Duarte & Canal,(2007).

#### 2.1.2 Remittances:

Remittance is a transfer of money by a foreign worker to his/her family member or an individual of his/her home country. They are often sending remittances to their home country on regular basis. Money transferred home by migrants challenge with foreign aid as one of the biggest monetary inflows to progress a country. Workers remittances are an important part of international capital flow particularly concern to those countries which normally expert their labors to the foreign countries. (History). Acosta, Lartey & Mndelman (2009), further narrated in results that remittances plays an important role to improve the personals life style and they can smooth income consumption and recreation. Worker's Remittances have become 2<sup>nd</sup> greatest source of pure financial flow of developing countries, Schioppa & Siegfried (2006).

#### 2.1.3 Foreign Direct Investment

A foreign direct investment (FDI) is a kind of investment in the form of controlling ownership in a business in one country by an entity based in another country. An increase in FDI may be linked with progress in economic growth because of inflow of capital and increased tax revenues for the country. (History). Developing and business sector economies, expanding interest in FDI inflows in the course of recent decades reflect both push and pull factor. (Reinhart & Reinhart, 2008). Arcabic, Globan & Razuk (2012) investigate the long run and short run relationship between FDI and Stock market of Croatia. And it proved that there was only a short term relationship exist between stock market and FDI in Croatia.

## 2.2 Empirical Literature Review

Khan and Zaman (2012) examined the relationship between macroeconomic variables and the stock prices in Karachi Stock Exchange (KSE), Pakistan. The study considered annual data from 1998-2009. GDP, Exports, CPI, Money Supply, Exchange Rates, Oil Price & FDI variables have been used. Augmented Dickey Fuller Test and Multiple Regression have been applied. Result shows that all variable are stationary at zero lag. It is also showed that GDP & ER positively affected stock prices whereas CPI negatively affected stock prices. The results of Exports, money supply, FDI and oil prices were insignificant. The correlation analysis shows strong correlation between stock prices and macro variables. Rise in the oil prices and inflation badly effect stock prices, which causes sharp decrease in KSE. It is suggested to the government of Pakistan to work on its law and order

situation and should provide protection to the foreign investors in order to increase foreign investment in country. Adam & Tweneboah (2009) scrutinized the impact of Foreign Direct Investment (FDI) on the Stock market development in Ghana by using Quarterly time series data from 1991:1 to 2006:4. Multivariate co-integration analysis of Johansen (1998, 1991) and (GIRF) from (VECM) methods have been applied to investigate the linkage between FDI and stock market development in Ghana. Results shows that there is a long-run relationship between FDI, nominal exchange rate (NER) & stock market development. And there is a significant positive impact on stock market development in Ghana. Here are two major recommendations to the policy makers. First, they should cut restrictions for the foreign investors for listed companies, so it can bring the required growth in the exchange market and economy as a whole. Second, the policy makers should formulate strategies to increase the FDI stock and offer incentives for long investing and listing in the stock market.

Adam & Tweneboah (2008) examined the effects of macroeconomic variables on the movement of stock prices in Ghana. Data covered Quarterly period from 1991:1 to 2006:4. ADF unit root test and PP unit root tests have been used. They have also applied Johansen Co-integration and estimation of a (VECM). Stock index, FDI, XR, CPI and Interest Rate variables have been used and all of them used as Log values. Results explored the long-run relationship between the macroeconomic variables using Johansen's multivariate co-integration tests. Further tests indicate that, in short-run inflation and exchange rates matter for sharp price movement in Ghana, although interest rate and inflation prove very significant in the long-run. We recommend that potential investors pay more attention to inflation and exchange rate dynamics followed by net FDI inflows rather than interest rates.

Jawaid & Haq (2012) investigates the effects of interest rates, exchange rates, and their volatiles on stock prices of banking industry of Pakistan by using monthly time series data from Jan 2004 to Dec 2010. Six variables have been examined. SP, focus variables such as ER, SIR, LIR, FDI, BOT, CPI, FR, REM and VF shows the volatilities of exchange rates and interest rates. Co-integration results suggested the reality of significant and -ve long-run relationship between exchange rate and short-term interest with stock prices. Whereas, positive and significant relationship exist between volatilities of exchange rate and interest rate with stock prices. Causality examination affirms bidirectional causality between stock prices and exchange rates. Although, unidirectional causality applied from short term interest rate to stock prices. Sensitivity analysis confirms that Causality analysis assure that the results are robust. It is recommended that investors should invest in banking sector stocks when exchange rate and interest rates are highly inconsistent or volatile.

Ali (2011) tries to analyze the explanatory power of two microeconomic variables and macro-economic variables to explain the dependent variable. He used DSE as a dependent variable and inflation, which is represented by CPI, industrial production index and foreign remittances as a macroeconomic predictor variable and Market P/E and monthly average growth in market capitalization measured in percentage as microeconomic predictor variables. Monthly time series data from July 2002 to December 2009 has been used. A Multivariate Regression test showed that inflation and foreign remittances have negatively related and industrial production index; P/Es and monthly percentage average growth in market capitalization have positively related with stock returns, which ultimately gives positive pressure in stock price.

Raza et al. (2015) scrutinized the significance of the inflow of foreign capital and economic growth on capitalization of Pakistan Stock Market by applying the annual time series data from the duration of 1976-2011. Dependent variable is Stock market capitalization along with this FDI and GDP used as independent variables. The autoregressive distribution lag bound testing co-integration approach, the error correction model and the rolling window estimation procedures have been performed to analyze the short-run and long-run behavior of Coefficients, respectively. Results indicate that FDI, worker's remittances and economic growth have significant positive relationship in long-run as well as in short-run. It is suggested in Pakistan, investors can make their investment decisions through keeping eye on the direction of FDI and GDP.

Billmeier & Massa (2007) survey the macroeconomic variables of stock market capitalization in a panel of 17 nations of Central Asia and Middle East, including both hydrocarbon-rich countries and economies without sizeable natural resources wealth. Annual panel data from 1995 to 2005 with 141 year observations for the whole sample has been used. Dependent variable is (the log of) stock market capitalization as a share of GDP and (remittances, investments, domestic credit and stock traded) are normalized by GDP, have been used as independent variables. They applied fixed-effect panel regression on pooled data. Results found that 1. The both institutions and remittances have +ve and significant effect on stock market capitalization and 2. Both regressors present, mainly in those countries where hydrocarbon sectors are not significant; while 3. In resourceful countries, stock market capitalization is mainly convey the oil prices.

Ahmed (2008) investigates the casual relationship between stock prices and key macroeconomic variables representing real and financial sector of the Indian economy for the period of March, 1995 to March, 2007 using quarterly data. Index of IP, exports, FDI, MS, ER, IR, NSE Nifty and BSE Sensex of India have been used as independent variables. Johansen co-integration test and Toda and Yamamoto Granger causality test have applied to explore the long-run relationships whereas BVAR modeling has been applied to examine short-run relationships. Result reveals differential causal links between aggregate macroeconomic variables and stock

indices in the long-run and similar in the short-run. It shows that the movement of stock prices are not just the results of behavior of key macroeconomic variables yet it is likewise one of the reason for development in other large scale measurement in the economy.

Malik (2013) scrutinized the role of foreign remittances and foreign private investment in the development of stock market of three South Asian countries namely Bangladesh, Pakistan & India. Panel data of 24 years from 1988-2011 have been used. The dependent variables in the stock market advancement “market capitalization” and three independent variables i-e foreign portfolio investment, foreign remittances and FDI inflows have been used. ADF and PP unit root tests have been used to check the stationarity. Furthermore correlation, co-integration and Granger causality test have been used. The correlation results show that sock market advancement is correlated with FDI inflows, portfolio investment and foreign remittances individually in all countries aside from negative correlation of 10.59% between portfolio investment and stock market development in Bangladesh. The results of Granger Causality test shows that FDI was granger cause to capitalization for India only. Capitalization granger cause FDI in Pakistan and India only. Capitalization granger causes portfolio investment just in India. Foreign remittances granger causes capitalization for India and Bangladesh whereas capitalization granger causes in Bangladesh for foreign remittances.

Kalim & Shahbaz (2009) investigates the impact of FDI on the stock market development of Pakistan by using monthly time series data from June, 2000- April, 2008. MC, FDI, SAV as a share of GDP, GNP per capita and INF, variables have been used. An ARDL bound testing approach is used for long-run relationship between variables and the error correction model is applied for short run dynamics. Results supports the complementary role of FDI in stock market progress in Pakistan. Additional macroeconomic variables affecting stock market development are domestic savings, GNP per capita, and inflation.

### 3. Methodology

On the basis of theoretical and empirical discussion above, this paper intends to scrutinize the impact of remittances & foreign direct investments on stock price in Karachi, Pakistan by using the following long-run equation for Stock prices (KSE100 Index) may be expressed as function of the Remittances and Foreign direct investment. (All variables have been used with log).

#### 3.1 Modeling Framework

$$KSE100 = f(REM, FDI) \tag{3.1}$$

$$LKSE\ 100 = \alpha + \beta_1 (LREM) + \beta_2 (LFDI) + e \tag{3.2}$$

Where,

$\alpha$  = change in KSE100 due to other factors except REM & FDI

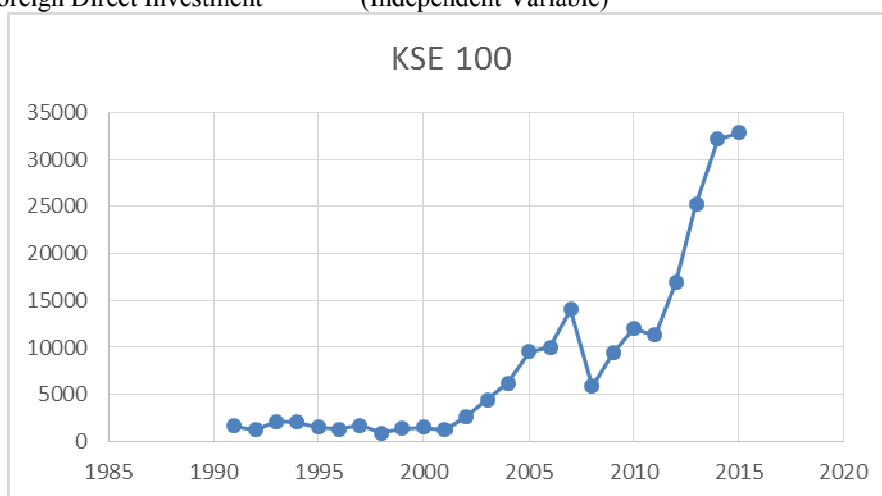
e = error term

$\beta_1, \beta_2$  = co-efficient

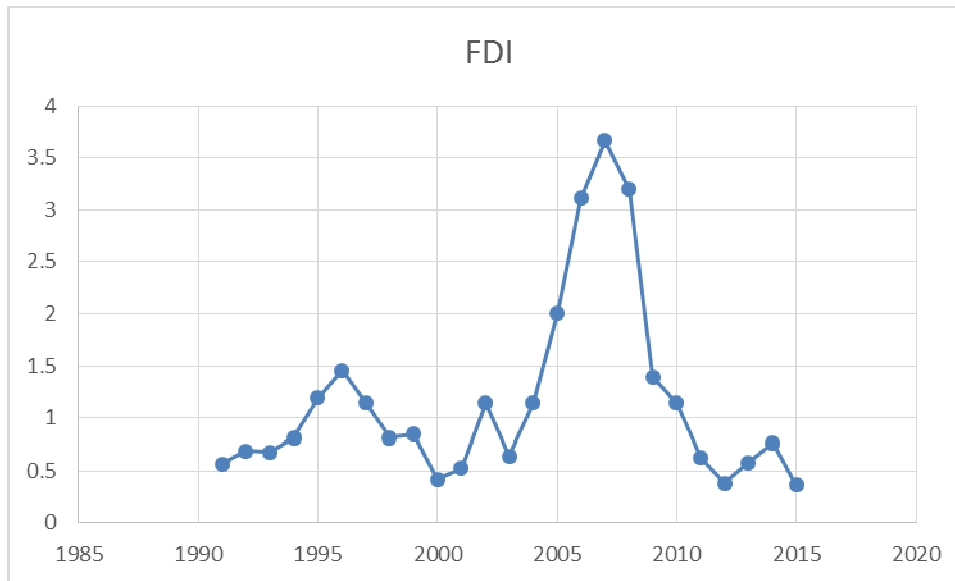
LKSE100 = Karachi Stock Exchange 100 Index (Dependent Variable)

LREM = Remittances (Independent Variable)

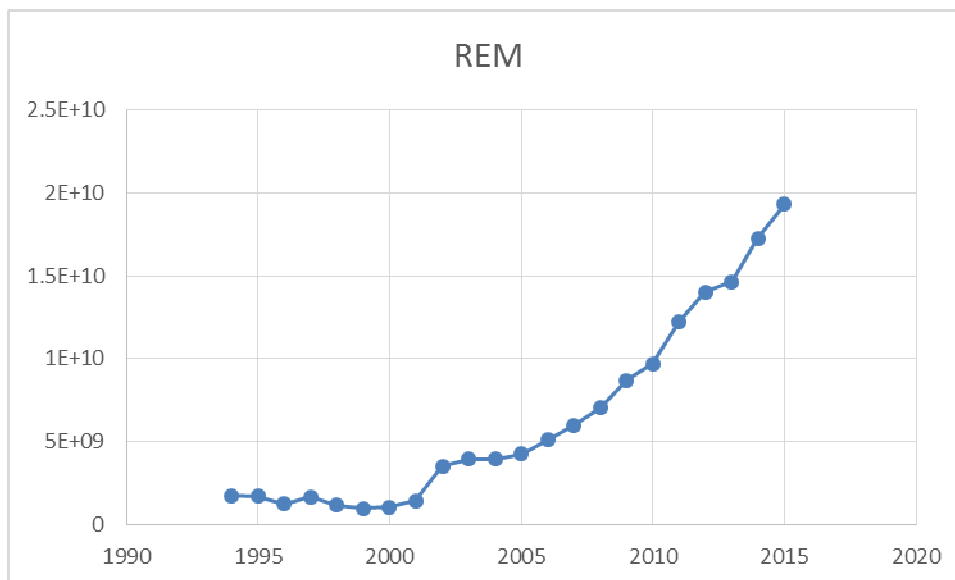
LFDI = Foreign Direct Investment (Independent Variable)



Graph 3.1



Graph 3.2



Graph 3.3

Khan & Zaman (2012) considered macroeconomic variables to check their relationship with Karachi Stock Exchange. Raza et al. (2015) and Kaleem & shahbaz (2009) have narrated the positive and significant relationship of FDI with KSE-100 Index for both long run and short run. Adam & tweneboah (2008) have also considered FDI as an indicator of stock market in Ghana.

It is showed in above graphs that there was a sudden increasing trend of FDI and Karachi stock exchange between 2006-2008, 2009-2014 respectively and a continues increasing trend of REM in Pakistan. To prove the above results we further employ the appropriate statistical tests to check the robustness of our results.

#### 4. Estimation and Results

##### 4.1 Unit Root Test:

To check data for stationary or non-stationary we performed unit root test. The variables which we have used are (at log). The results of unit root test are as follows.

H<sub>1</sub> = Data is Stationary

**Table-4.1**  
**Stationarity Test Results**

	<i>Augmented Dickey Fuller (ADF)</i>				<i>Philips-Perron (PP)</i>			
	<i>I(0)</i>		<i>I(1)</i>		<i>I(0)</i>		<i>I(1)</i>	
	<i>C</i>	<i>C&amp;T</i>	<i>C</i>	<i>C&amp;T</i>	<i>C</i>	<i>C&amp;T</i>	<i>C</i>	<i>C&amp;T</i>
KSE100	0.9383	0.3814	0.0001	0.0004	0.9579	0.3814	0.0001	0.0004
REM	0.9767	0.5516	0.0062	0.0201	0.9767	0.5616	0.0062	0.0199
FDI	0.3967	0.8408	0.0121	0.0426	0.3678	0.7750	0.0120	0.0421

As it is apparent from Table 4.1, the results confirm the rejection of null hypothesis of unit root (whether or not trend is included in regression), at level for each variable on the basis of two methodologies i-e Augmented Dickey Fuller(ADF) statistics and Phillips- Perron (PP) test. First difference of all variables therefore accept the null hypothesis of unit root (whether or not trend is included in the regression) for each variable. Based on these results, it is therefore, concluded that all the series are stationary at first difference i-e  $I(1)$ . This showed that the combination of these series may be resulted in a long run relationship. We, therefore, proceed with Co-integration test.

#### 4.2 Co-Integration Test

$H_1$  = Co - integration Exist.

**Table 4.2**

<b>Null Hypothesis No. of CE(s)</b>	<b>Trace statistics</b>	<b>10% critical values</b>	<b>Max Eigen values statistics</b>	<b>10% critical values</b>
<b>None</b>	30.85405	32.26837	21.15609	20.05014
<b>At most 1</b>	9.697966	17.98038	6.418631	13.90590
<b>At most 2</b>	3.279334	7.556722	3.279334	7.556722

Starting with our claim that there is a co-integration among variables, the trace statistics is less than 10 percent critical value. Hence it rejects the hypothesis of co-integration exist. Turning to the Maximum Eigen value test, the null hypothesis of co-integration is accepted at 10 percent level of significance, so there is co-integration exist. Hence, the results from trace statistics shows that there exist a weak and short term relationship of stock prices with its major determinants i-e REM and FDI.

#### 4.3 Causality Analysis

In this section we have applied Granger causality to reconfirm the relationship among the stock exchange, REM and FDI.

To ascertain the direction of causation between three variables, standard “Granger, 1969) structure has been used. Jones, 1989 and Jawaid, 2014 reveal that ad hoc selection method for lag length in Granger Causality test is superior to any other statistical method to examine optimal lag. Therefore, for Causality analysis assuming lag 1 for the models of relationship between KSE100, FDI and REM, and the results found that there is a unidirectional causality running from REM to KSE 100 Index. Whereas, application of lag 2 also reconfirm the causal relationship among REM and KSE100. The results of Granger causality test has been reported in Table 4.3.

**Table 4.3**

<b>Null Hypothesis</b>	<b>F-statistics</b>	<b>Prob.</b>
FDI does not cause KSE100	0.10070	0.7541
KSE100 does not cause FDI	1.21012	0.2838
REM does cause KSE 100	7.59256	0.0119
REM does cause KSE-100	3.05851*	0.0719*
KSE100 does not cause REM	0.32511	0.5746
REM does not cause FDI	0.09792	0.7574
FDI does not cause REM	0.04833	0.8281

The results of Table 4.3 elaborate that there is unidirectional causal link between REM and KSE100 and it proved by testing in both lags i-e 1 and 2. It is therefore revealed that there is no bidirectional causal relationship found among all three variables. There is only REM which is associated with KSE100 in Karachi



#### 4.4.1 Ordinary Least Square Method

Table 4.4.1

<i>Variables</i>	<i>Co-efficient</i>	<i>t-statistics</i>	<i>Prob.</i>
<b>Constant</b>	-17.26022	-10.67495	0.0000
<b>REM</b>	1.053726	12.30345	0.0000
<b>FDI</b>	0.119411	1.260075	0.2208
<b>Adj. R<sup>2</sup></b>	0.925036	<b>F-statistics</b>	149.0758
<b>D.W</b>	1.521097	<b>Prob.</b>	0.000000

The results of Ordinary Least Square Method reveals that there is a significant and positive impact of REM on KSE100. The one unit increase in REM will increase KSE100 by 1.054 units while FDI has insignificant impact on KSE100, other things remain constant. And results can be expressed as:

$$\mathbf{KSE100} = -17.26022 + 1.053726 \cdot (\mathbf{REM}) + 0.119411 \cdot (\mathbf{FDI})$$

The results of Adj. R<sup>2</sup> indicates that our model is 92.5 % fit and F-statistics is 149.0758, which shows a great effect of dependent variable and its prob. value is 0.000000 which is highly significant i-e 99.99%, and it shows the combine effect of dependent variables.

#### 5. Conclusion.

After reviewing literature review and best of our knowledge, over the last few decades the relationship between KSE100 Index, FDI and REM have been less studied together. This research intends to participate to the existing literature by using annual time series data of Pakistan by the application of standardized econometric techniques. The unit root test confirms that non-stationary data at level and stationary at 1<sup>st</sup> difference. The result of Co-integration test reveals the weak and short-run relationship between dependent and independent variables. Moreover, the result of ordinary least square method and causality analysis confirms that during 1991-2015 out of both independent variables, REM plays a positive and significant role in a rapid progress of stock prices in developing nations like Pakistan. Consequently, there is a significant and positive impact of REM on KSE100 Index while insignificant relationship found in case of FDI and KESE100 Index in Pakistan. It is therefore recommended to the policy makers and Government that they should work on their exchange rates so that it helps to increase FDIs in Pakistan which may leads to significant impact on KSE100 Index and ultimately, it will resulted in a favor of Pakistan's economy.

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\*Results of Causality analysis on lag 2.