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The Impact of Macro-economic Determinants on Market Capitalization: An Empirical Analysis in Context of Pakistan

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Abstract:
Purpose – The motive of this study is to scrutinize the impact of macroeconomic determinants on market capitalization in the context of Pakistan.
Design/methodology/approach –Annually time series data for the period of 1995-2014 has been collected. Descriptive statistic, Correlation and Regression analysis techniques have been employed in order to ascertain the alliance among stock market performance and pre-specified macroeconomic determinants.
Findings –The study results pointed that there is strong correlation between Market Capitalization, Foreign Direct Investment, Money supply and Oil prices. The results of Regression analysis demonstrated that Foreign Direct Investment, Money supply and Gross Domestic Product have significant positive relationship with Market Capitalization while Oil prices have significant negative relationship with Market Capitalization.
Originality/value –The foremost contribution of current study is that it adds value to existing literature by exploring connection between macroeconomic determinants and Market Capitalization in a developing economy.

Keywords: Market capitalization, money supply, macroeconomic, regression analysis, Pakistan

1. Introduction

In Business research most of studies are aimed to find out such components that can influence stock market performance. Stock market expansion can be calculated by its size, volatility, liquidity and concentration. There are different macroeconomic factors that can effect on market capitalization, but in our research we are considering only Foreign Direct Investment (FDI), Money supply (M2), Oil prices (OP), Interest rate (IR), Gross Domestic Product (GDP) and Inflation rate (INF). The present study takes into consideration the effect of above mentioned macroeconomic determinants on Market Capitalization in Pakistan.

This study attempts to discover the strength of relation among the Market Capitalization and selected Macroeconomic determinants, further it attempts to find out either there is negative relation or positive relation between Market Capitalization and selected Macroeconomic determinants. It also makes important contribution to existing literature that investigates the consequences of macroeconomic determinants on the performance of stock market.

Stock market is very essential pillar for the economy of any country. It plays vital role in the overall growth and development of the economy. It is an important channel of investment for both local and overseas investors. The changes in the indexes can be used as a way to examine the stock market performance. These changes can occur due to different factors such as political conditions of any country, world events, companies' scandals and macroeconomic variables etc.

In Pakistan the first stock exchange was Karachi stock exchange, which was recognized in 1947. There are two other stock exchanges which are operating in Pakistan, one is Lahore stock exchange and other is Islamabad stock exchange. LSE was recognized in 1970 and ISE started its work in 1989. In Pakistan Karachi Stock Exchange is the major stock exchange, because if we compare it with LSE and ISE the Karachi stock exchange has the largest capitalization share. In 2002 the Karachi Stock Exchange was avowed as the best performing world stock market (Business week).

According to the Efficient Market Hypothesis, share prices depict all relevant information. That's why, Sieng and Leng (2005) argued that analysis of the vibrant association among macroeconomic determinants and stock market growth is very crucial to project macroeconomic policy to affirm economic evolution in long run. Numerous studies reviewed the Market Capitalization and various elements impacting on it. For instance, Chen et al. (1986) after collecting data on stock values and macroeconomic indicators; they described that asset prices are distressed due to unexpected economic information.

The central part of this study is its eminence given to macroeconomic determinants and stock market growth in a developing country, meanwhile previous studies have focused on stock markets growth and economic growth in developed countries. Weintensely rely on

that our paper delivers a unique input to business literature because we are the first to scrutinize the strength of this relationship in Pakistani context.

The rest of the paper is structured as follows: Section 2 looks at examination of relevant literature on macroeconomic determinants and stock market performance. Section 3 clarifies data and methodology while section 4 reveals empirical results and interpretation. Section 5 concludes the paper and finally section 6 presents' references.

2. Literature Review

Numerous researchers tried to found the link among macroeconomic indicators and stock market performance by using various dynamic models. A prior study on macroeconomic determinants and stock market development predominantly recommends that there is a connection between stock market expansion and macroeconomic indicators but the scrupulous nature of the association has been unfounded. Economists clasp different opinions on the nature of interrelationships among Market Capitalization and economic growth. However, literature review portion in current study will primarily focus on certain resent outcomes on the subject under inquiry.

2.1. Foreign Direct Investment

In Cameroon (Zhou et al., 2015) analyzed data during 2006-2011 in order to show the determinants that would disturb stock market performance. Results clarified that foreign direct investment is key element of stock market expansion in Cameroon. While economic growth has no major effect on stock market growth.

Zafar (2013) searched whether stock market performance and economic conditions are interrelated with each other or not. Time series data during 1988-2008 was examined to achieve the study objective. Findings revealed foreign direct investment have positive impact and interest rate adversely influence stock market expansion.

(Alfaro et al., 2004) examined link between Foreign Direct Investment and Financial markets by using data for 20 years. Data has been extracted from International Financial Statistics. Results showed that FDI promotes growth through financial markets so significant relation is found between them.

2.2. Money Supply

Kibria et al. (2014) inspected link between stock market yields and macroeconomic factors in Pakistan by using annual data of 23 years. To obtain the objective of study four techniques were used including Granger Causality Test and Regression analysis. Findings exposed that inflation, GDP and money supply have momentous effect on KSE-100 index.

Rjoub et al. (2009) narrated in their research that there exists important pricing association among stock proceeds and macroeconomic factors for instance inflation, interest rate and Money supply. Study was conducted during 2001-2005 by taking monthly data from ISE. Results indicated in ISE numerous other macroeconomic elements are distressing stock market proceeds other than the examined.

In Malaysia researchers found that Malaysian stock market index is influenced by variations in macroeconomic determinants like Money supply and Interest rate. Co-integration and Granger Causality analysis were employed to investigate the linkage stuck between selected indicators and stock market indexes (Ibrahim & Aziz, 2003; Rahman et al., 2009).

In Singapore (Maysami et al., 2005) analyzed monthly time-series obtained from the Singapore Statistics for the period of 20 years to elaborate long run association relating to macroeconomic indicators and STI. Their results revealed that all nominated macroeconomic factors for example money supply have major effect on Singapore Stock Market.

In five Asian states (Malaysia, Indonesia, Philippine, Singapore and Thailand) a research was conducted by analyzing the data over the period of 1985-1996 and it was concluded that macroeconomic variables in such countries cause and caused by stock values in both short and long run (Wongbangpo & Sharma, 2002).

2.3. Oil Prices

Billmeier & Massa (2009) described link among macroeconomic indicators and stock market growth by taking the panel of 17 developing markets in Central Asia and Middle East. Findings of study revealed that those countries which have oil reserves in those countries stock market capitalization is pushed out by oil prices.

Hamma et al. (2014) under took a research with the objective to discover the link stuck between oil prices and stock market volatility. Data for study has been derived from trading week for the period of 2006 to 2012 and it was decided that stock market yields are exaggerated by oil prices.

International multi-factor model has been employed to inspect the connection among stock market proceeds and oil prices for the evolving capital markets of Central and Eastern European Countries (CEECs). It was concluded that oil prices are an important factor to ascertain the return of financial market (Asteriou & Bashmakova, 2013).

Granger causality test was employed to finds out the link stuck between oil prices and Indian stock market. Data for 20 years for the period of 2001-2013 was used for empirical analysis. Study exposed that positive tremors in oil prices have growing constructive effect on stock exchange in short term (Nath Sahu,et al., 2014).

A research was conducted in major developed countries and it was determined that higher oil prices harmfully influence stock market yields in France, UK and United States, the impacts are constructive in Australia and Canada because these countries are noteworthy exporters of energy resources (O'Neill et al., 2008).

2.4. Interest Rate

It was argued that long run and short run interest rate was not affecting Vietnamese stock prices while industrial production favorably influence Vietnamese stock values. Time series data for the interval of 2001-2008 was derived for analysis. Finally, it was concluded that the US real production activity has powerful impact on Vietnamese share rates (Hussainey & Khanh Ngoc, 2009).

Cherif & Gazdar (2010) discussed different factors that influence the stock market performance in Mena. Data was obtained from 14 Mena countries for17 years from 1990-2007.Results suggested that earning and interest rate effect stock market expansion.

In Turkey (Toraman & Başarir, 2014) under took a study to find out the long run association among interest rates and stock market capitalization by using data from 1998-2012.Johansen Co-integration technique was used to test results. Findings demonstrated that there is long run link among stock market capitalization rate and interest rate

In Sari Lanka (Nijam et al., 2015) studied time series data extracted from Economic and Social Statistics and Central Bank Annual Reports for the period of 1980 to 2011. Researcher concluded macroeconomic determinants and stock markets are significantly related with each other. GDP and interest rate are positively while inflation is adversely related with stock market performance.

In India (Pal & Mittal, 2011) investigated quarterly data covering the period from 1995-2008. In order to develop sort and long run link among variables co-integration test, unit root test and error correction mechanism (ECM) have been employed. Researcher concluded that macroeconomic factors influence capital markets.

Bracker et al. (1999) conducted research in which they found that different macroeconomic factors including interest rate are significantly related with the stock market incorporation over time. Monthly data for 22 years from 1972 through 1993 has been taken in order to investigate the relationship.

2.5. Gross Domestic Product

Garcia & Liu (1999) clinch a research by taking data from 15 industrial and emerging countries from 1980-1995. Findings suggested that earnings, saving rate and liquidity of financial market are essential determining factor of stock market capitalization; on the other hand macroeconomic steadiness doesn't prove significant.

In Jordon (El-Nader & Alraimony, 2013) studied monthly data during 1990-2011 to investigate short run and long run connection among stock market capitalization and macroeconomic determinants and a stable link was found among stock market performance and macroeconomic factors.

Kibria et al. (2014) inspected association among stock market returns and macroeconomic factors in Pakistan by taking annual data of 23 years. To obtain the objective of study four techniques were used including Regression analysis and Granger Causality Test. Findings exposed that inflation, GDP and money supply have major effect on KSE-100 index.

2.6. Inflation Rate

In South Africa (Ho, 2017) investigated annual time-series data acquired from World Development Indicators website during 1975-2015. The study was under taken to discover the impact of macroeconomic factors on stock market expansion. Results suggested that in long run economic development has positive impact on stock market growth while inflation adversely impact.

In Ghana (Owiredu et al., 2016) analyzed the effect of macroeconomic indicators on GSE. It was concluded that macroeconomic determinants have no major effect on stock expansion in Ghana.(Kyereboah-Coleman & Agyire-Tettey, 2008) pointed that inflation has adverse effect on stock market enactment in Ghana.

In China (Bai, 2014) argued in their research that China's current price index affected by inflation is very limited. This study was conducted with the aim to find out the effect of inflation on financial market in china and it was found that the effect of inflation on the macro economy is very obvious.

Geetha et al. (2011) accompanied a study to find out the association among inflation and stock proceeds. Results discovered that there is long run correlation among inflation and stock yields while there is no short run association among these factors for US and Malaysia but it subsists in case of China.

In Egypt long run and short run relation was found among inflation and Egyptian stock exchange. Co-integration was used to test the short run and long run connection. The researcher concluded there is adverse relationship between market liquidity and inflation (Omran & Pointon, 2001)

Shahbaz et al. (2013) pointed out macroeconomic determinants which are responsible for stock market capitalization in Pakistan. For study data was taken from International financial statistics for the period of 1974-2010. Results show that inflation, economic development and financial growth increases stock market growth.

3. Data and Methodology

In this study secondary data has been employed to find out the effect of macroeconomic determinants on market capitalization in Pakistan. The crucial macroeconomic indicators encompassed in current study are as Foreign Direct Investment (FDI), Money supply (M2), Oil prices (OP), Interest rate (IR), Gross Domestic Product (GDP) and Inflation rate (INF) Inflation. Pre-specified macroeconomic factors are taken as independent variables and Market Capitalization treated as dependent variable. In current study data is taken for the period of 1995-2014 and the source of data is World Development Indicators website while the Oil prices are extracted from trading economics website.

Prior researchers have applied several techniques to clarify the connections among macroeconomic indicators and stock values (Hussainey & Khanh Ngoc, 2009). We keep an eye on the procedure presented by (Zafar, 2013) to scrutinize the connection among stock values and macroeconomic determinants. For such purpose we employed Descriptive statistics and Correlation model to analyze

the link among dependent and independent variables. With the aim to examine the strength of connection between selected macroeconomic indicators and Market Capitalization and how significantly they influence each other Regression analysis has been used.

3.1. Theoretical Frame Work

In case of increase in inflation the share prices raise due to which Market Capitalization will increase. If Money supply increases it shows that more liquidity is available to buy securities, as a result stock prices increase due to increase in demand for stock and Market Capitalization will increases. There exist adverse link among interest rate and stock values because most of stock is purchased with borrowed money if interest rate upsurges the cost of borrowing increases and investors will demand high return for their investment in this way demand for securities will decreases vice versa.
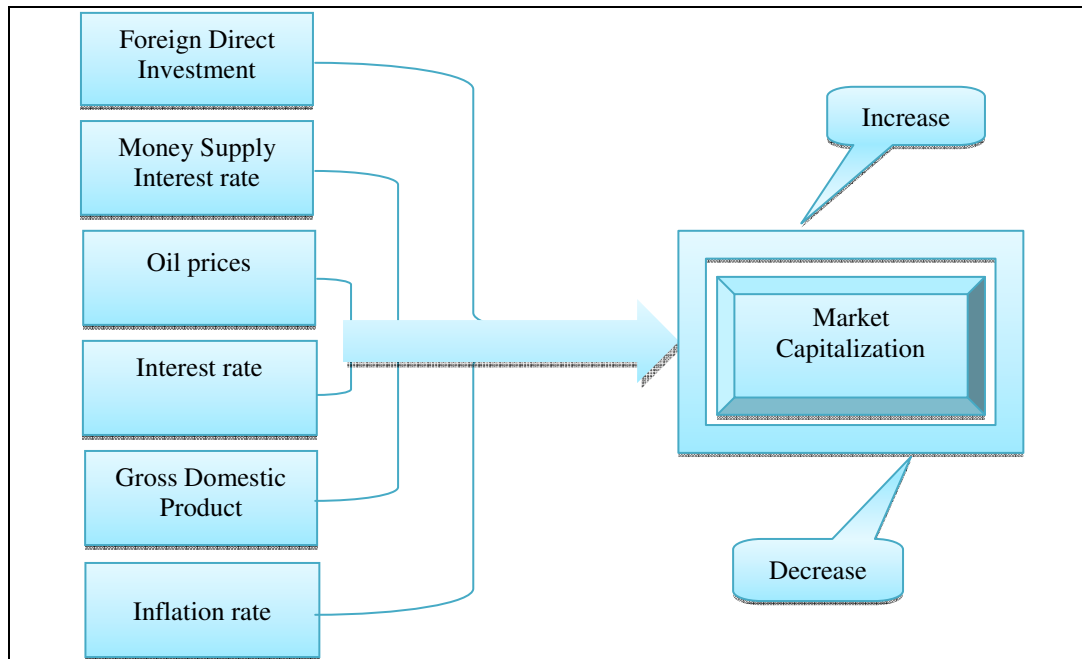
3.2. Conceptual Framework

Figure 1
Source: Model developed by the authors

3.3. Variables of Study

3.3.1. Dependent Variable

Market Capitalization (MC): The Market Capitalization also denoted as Stock market development this concept has numerous features. This is typically computed by stock market scope, fungibility, impulsiveness, assemblage and incorporation with global financial markets, and the authorized rule (guideline and administration) in the market (Garcia & Liu 1999).

3.3.2. Independent Variables

Foreign Direct Investment (FDI): The Foreign Direct Investment is crucial for economic development. However, countries having excellent financial markets take advantage from FDI. Due to the 'growth-development' conveniences of FDI, numerous states and areas have chased dynamic policies to fascinate FDI (Alfaro et al., 2004).

Money Supply (M2): Money supply comprises coins, cash in hand and cash at bank. At any given time the entire quantity of monitory resources is money supply. If money supply increases normally the interest rate become low due to this investment lifts up (Kibria et al., 2014).

Oil Prices (OP): The Oil prices are considered in this study as independent variable as fluctuations in crude oil prices upset the economy in several diverse and momentous means such as when oil prices raise the cost of production of several commodities rises. It also gives raise to conveyance and boiler cost. That's why buyers, practitioners and governments are seriously worried about the impulsiveness of oil prices and the aforementioned potential harmful economic consequences (Hamma et al., 2014).

Interest rates (IR): Interest rate can be defined as the amount paid for the use of borrowed money. It can be calculated by dividing amount which lender demands for lending money to total amount of money that lender provides to the borrower and the resulting amount is multiplied with 100 (Siam et al., 2010).

Gross Domestic Product (GDP): The Gross Domestic Product (GDP) growth rate is used to estimate economic activity. It can be used to match the performance of various countries with each other. In order to calculate it entire amount of all commodities and services produced within the boundaries of a country is taken in a given time period (Kibria et al., 2014).

Inflation rate (INF): Inflation is upsurge in the amounts of goods and service causing dropping the buying power of individuals. It is calculate by using consumer price index. Inflation shakes the economy emphatically or adversely. If inflation rate rises investors feel reluctance to make investment (Kibria et al., 2014).

3.4. Research Model

Current study uses time series data to evaluate the consequences of macroeconomic elements on Market Capitalization. The simple framework for the time series data is defined by subsequent regression model:

$$Y = \alpha + \beta x + \varepsilon \quad (1)$$

Here dependent variable (Market capitalization) denoted by Y. Intercept term is denoted by α, β shows slope, whereas *x* shows independent variable. The functional arrangement of above model is as follows:

$$MarketCapitalization = f(Macroeconomicdeterminants) \quad (2)$$

Where Market capitalization is measured by macroeconomic determinants which includes Foreign Direct Investment, Money supply, Oil prices, Interest rate, Gross Domestic Product and Inflation rate.

Intensifying the proxies used in model 2 will give in the following model:

$$MC = \alpha + \beta_1 FDI + \beta_2 M2 + \beta_3 OP + \beta_4 IR + \beta_5 GDP + \beta_6 INF \quad (3)$$

MC is dependent variable, α is y-intercept and FDI, M2, OP, IR, GDP and INF are independent variables while ε is random error term.

MC= Market Capitalization
FDI= Foreign Direct Investment
M2= Money Supply
OP= Oil Prices
IR= Interest rate
GDP= Gross Domestic Product
INF= Inflation rate

4. Empirical Results and Interpretation

In Table1, the descriptive statistics presented to analyze and measure the influence of macroeconomic determinants on market capitalization. Table 1 displays mean, maximum, minimum and Std. Dev. values for variables. Mean represent the average value and standard deviation shows deviation of value from mean. The value of mean, maximum, minimum and standard deviation is derived as under:

Variables	Mean	Max.	Min.	Std. Dev.
MC	3.9935	4.8467	0.5846	1.1519
FDI	3.0711	3.7474	2.4885	0.3672
M2	6.4624	7.0075	5.1900	0.3452
OP	1.5915	1.9912	1.1139	0.2892
IR	0.8214	1.0000	0.6020	0.0998
GDP	0.5620	0.9030	0.0000	0.2167
INF	0.8779	1.3010	0.4771	0.2421

Table 1: Descriptive Statistics

The descriptive statistics shows Mean value of MC is 3.9935 that illustrates most of values in MC are round about 3.9935. Its maximum value is 4.8467 and 0.5846 is its minimum value. Similarly INF has mean value of 0.8779 and its maximum and minimum values are 1.3010 and 0.4771 respectively. In case of IR average value is 0.8214 while its maximum value is 1 and minimum value is 0.6020.

M2 has mean value of 6.4624. Table 1 displays M2 has highest mean value that is 6.4624 and GDP has lowest mean value that is 0.5620. The average value FDI is 3.0711 while 3.7474 and 2.4885 are its maximum and minimum values respectively. However OP has an average value of 1.5915 and maximum value in case of OP is 1.9912.

Variables	MC	FDI	M2	OP	IR	GDP	INF
MC	1						
FDI	0.5234	1					
M2	0.5500	0.5859	1				
OP	0.6307	0.6389	0.9233	1			
IR	-0.3574	-0.5453	-0.5811	-0.6140	1		
GDP	0.1309	0.1468	0.0877	0.1861	-0.1909	1	
INF	0.3836	0.2676	0.3583	0.4648	-0.7007	-0.1721	1

Table 2: Correlation Matrix

Table 2 shows the correlation between dependent variable (MC) and selected independent variables. Results indicate that only IR is negatively correlated with dependent variable i.e. Market Capitalization and all other variables are positively correlated with MC. It is derived that FDI has sound positive correlation with MC. Similar results found by (Zafar, 2013).M2 also has strong positive relationship with MC while GDP has weakest positive relationship with MC. Results revealed that OP has strongest positive correlation with MC i.e. 0.6307 as compare to all other selected macroeconomic factors.

Results showed that Inflation has strongest positive correlation with FDI i.e. 0.6276 while it negatively correlates with GDP and IR. Interest rate has negative correlation with MC and with all other variables, which is similar to the results of (Zafar, 2013).There exists strongest negative correlation between IR and INF i.e. -0.7007.

M2 has strongest positive correlation with OP and such kind of strongest positive correlation does not exist between all other selected variables i.e. 0.9233. If we compare how much FDI correlate with all other dependent and independent variables we come to know that it has strongest positive correlation with OP and from Table 2 its value can also be seen i.e. 0.6389.

GDP has weak correlation with all dependent and independent variables. It negatively correlates with INF and IR while positively correlate with other indicators.

Variable	Coefficient	t-Statistic	Prob.
C	-3.1137	-1.7703	0.0767
FDI	0.3181	2.3307	***0.0198
M2	1.0124	3.5709	***0.0004
OP	-0.5936	-1.7588	**0.0786
IR	0.2369	0.4041	0.6861
GDP	0.5932	3.0635	***0.0022
INF	0.3731	1.3777	0.1683
R-squared	0.6615		
F-statistic	113.8572		
Prob (F-statistics)	0.0000		

Table 3: Dependent variable: MC
*Note: *** shows significance level at 5% and ** shows significance level at 10%.*

Table 3 demonstrates regression results. Regression analysis has been used to discover whether statistically significant link exists among MC and selected macroeconomic determinants. Regression results showed that M2 (0.0004), FDI (0.0198) and GDP (0.0022) have significant positive relationship with MC while and OP (0.0786) has significant negative relationship with MC. Results also revealed that IR (0.6861) and INF (0.1683) do not have significant relationship with MC.

The value of R-squared is (0.6615) which shows that 6 selected macroeconomic factors (FDI, M2, OP,IR,GDP and INF) which are the part of this study account for 66% change in dependent variable i.e. Market Capitalization (MC). This shows that it is a good model as it includes variables which can be used to forecast the stock market development that can be denoted by MC.

5. Conclusion and Policy Implications

Stock market is significant element for economic growth and therefore has utmost importance for the development of any country. Macroeconomic determinants can upset the growth of stock markets. This study has discovered most important factors of stock market expansion in case of Pakistan by using annual data for the period of 1995-2014. In order to scrutinize the effect of macroeconomic determinants on stock market capitalization; Descriptive analysis, correlation analysis and regression analysis has been accompanied.

It is concluded that significant relationship exist among Market Capitalization and selected Macroeconomic variables. Money Supply, Foreign Direct Investment and Gross Domestic Product positively influence Stock Market performance while Oil Prices negatively influence Stock Market performance. Study results also disclosed that Inflation and Interest rate have no noteworthy effect on Stock Market performance.

Relating to the perspective of policy implications, current study proposes that government should offer enticements to outsiders for investment because foreign direct investment enriches stock market capitalization that not only encourages economic activity in fact it also ripens financial markets. As economic factors perform vital role in the evolution and expansion of stock market due to this Policy makers in Pakistan may induct policies to raise economic progression.

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